

Mountain Goat Management Report

of survey-inventory activities
1 July 1999–30 June 2001

Carole Healy, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation
December 2002



ADF&G

Please note that population and harvest data in this report are estimates and may be refined at a later date.

If this report is used in its entirety, please reference as: Alaska Department of Fish and Game. 2002. Mountain Goat management report of survey-inventory activities 1 July 1999–30 June 2001. C. Healy, editor. Project 12.0. Juneau, Alaska.

If used in part, the reference would include the author's name, unit number, and page numbers. Authors' names and the reference for using part of this report can be found at the end of each unit section.

Funded in part through Federal Aid in Wildlife Restoration, Proj. 12, grants W-27-3 and W-27-4.



SPECIES
MANAGEMENT REPORT

Alaska Department of Fish and Game
DIVISION OF WILDLIFE CONSERVATION
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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999

To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 1A (5000 MI²)

GEOGRAPHIC DESCRIPTION: Ketchikan area including mainland areas draining into Behm and Portland Canals.

BACKGROUND

Severe winter weather conditions during 1968–1975 resulted in up to 90% reductions in Unit 1A mountain goat populations (Smith 1984). Subsequent moderating weather enabled populations to recover and we believe they are currently stable at moderate to high levels throughout most of the unit.

Steep glacial valleys and peaks in Unit 1A provide important escape terrain for goats from predating wolves and bears. Alpine vegetation consists of heath fields and provides goats with nutritious forb-sedge meadows. At lower elevations dense stands of old-growth forest provide necessary cover, and shrubs and evergreen forbs provide goats with important foods during critical winter months.

Although goats historically inhabited only the subunit's mainland, they now occur on Revillagiedo (Revilla) Island as a result of introductions to Swan Lake (17 goats) in 1983 (Smith and Nichols 1984) and Upper Mahoney Lake (15 goats) in 1991 (ADF&G Unpubl. data, Ketchikan). These areas were selected as introduction sites because they appeared to have suitable escape terrain and adequate winter habitat. The Swan Lake population has increased substantially and we believe it now numbers roughly 160–200 goats. This increase resulted in a hunting season in the eastern part of Revilla Island in 1993. The Revilla Island harvest has remained low since its inception. Rugged terrain and poor access are believed to be responsible for the low harvest.

We estimate that the Upper Mahoney Lake population currently numbers about 100–140 goats. These goats have expanded their range and are utilizing most of the suitable goat habitat in this area. This herd is somewhat isolated, because access to other suitable habitat would require a substantial move across more than 10 miles of open, low elevation habitat. At present there is no hunting season for the Mahoney herd, however ADF&G plans to submit proposals to the state

Board of Game (BOG) in November 2002 for a limited drawing hunt. ADF&G has concerns about the increasing fixed-wing aircraft and helicopters traffic near this introduced herd. We will continue to educate the Ketchikan public, particularly air carriers, about disturbance-related stress and its potential effect on goats. Frid (1997) found that although some habituation to disturbance likely occurs in most situations, there is no evidence suggesting that it occurs enough to eliminate potential impacts of intense, chronic disturbance on reproductive success.

Hunter harvests from Unit 1A averaged roughly 45 goats each season during 1972–1988. The average annual harvest dropped to about 25 during the past 9 seasons as a result of 1989 legislation requiring nonresident goat hunters to hunt with a registered guide. Cyclic and unpredictable weather severity, healthy predator populations, and density-related over-foraging of habitat are believed to be more influential than hunting in modifying the unit's goat populations.

To monitor population changes caused by winter weather, over-foraging, and predation, the department completes aerial surveys of most of the established trend count areas (TCAs) annually or biannually during late summer and fall. Typically in Unit 1A that means about half of the 13 TCAs are counted during any given year. Although we believe survey results generally reflect population trends, we have found that weather conditions immediately prior to and during surveys can greatly influence our ability to observe goats and accurately estimate herd size. Nichols (1980) found when properly done, counts made under good conditions (i.e., overcast skies, soft light, no turbulence) in early to midsummer, included about 90 percent of the goats found from ground or helicopter surveys. Results were lower and more inconsistent when made on clear, sunny days because of glare and because some goats were hidden from observers. Some observers believe that helicopter and ground counts provide the optimal estimate of actual numbers. However, the cost and logistics of such measures make them impractical in most areas of Alaska.

Goat sightability is an important factor in estimating the actual number present, or in determining trends based on goats observed during aerial surveys. For example, in Southeastern Alaska and British Columbia, where goats spend considerable time in forested habitats (Schoen and Kirchhoff 1982, Fox 1983, Smith 1983, Herbert and Turnbull 1977, Foster 1982), goat sightability is generally low. Foster (1982) reported an average sightability of only 42% for ground surveys in west central British Columbia. From fixed-wing aircraft even when aided by telemetry, Smith (1983) averaged only 30% sightability in coastal Southeast Alaska. Smith (1983) also compared fixed-wing aircraft surveys with helicopter counts of the same area with similar results. This same study estimated the density of goats in Unit 1A at between 1.0–2.3 goats/km².

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

1. Maintain goat population densities that provide greater than 20 goats per hour of survey time during fall surveys, and when not achieved, determine probable causes.
2. Survey goats often in established trend count areas throughout Unit 1A.

3. Monitor sex composition of the harvest and manage for < 6 points per hundred goats using a weighted harvest point system (males = 1 point, females = 2 points).

METHODS

We attempt to survey at least 6 of the unit's 13 established TCAs each fall as weather and work schedules allow. TCAs vary in size from 23–200 mi². We generally initiate surveys during late August or September, and begin daily efforts between 0500–0800 or 1700–1900 hours. We use a PA-18 Supercub with a pilot and one observer flown at an altitude of 200–300 feet above the ground. Both the pilot and observer search for goats and the observer records observations on a 1:63,360 topographic map. We classify goats as either adults or kids, and make no effort to ascertain sex or distinguish other age groups.

We obtain harvest information through a mandatory hunt report that is part of a required registration permit. Information collected includes the areas and numbers of days hunted, hunter success, dates of hunts and kills, transport methods, and commercial services used. Successful hunters who pursue a second goat are treated as separate hunters for the purposes of calculating and presenting hunt and harvest information.

A weighted point system is applied to the annual harvest to determine a guideline harvest level. Points are weighted more heavily for females (2 points) than for males (1 point). Using the number of goats observed during annual fall surveys, we apply a harvest cap (6 harvest points allowed per 100 adult goats observed) using a 3-year running average. Hunt areas that reach the harvest cap are closed by emergency order. Smith (1983) stressed the need to monitor both short and long-term environmental fluctuations and subsequent variations in population parameters to assist in making management decisions.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

During fall 1999 we completed aerial surveys in the following TCAs: K-3 Rudyerd Bay to Smeaton Arm, K-5 Marten Arm to Portland Canal, K-7 Yes Bay/Reflection Lake, K-8 Bradfield Canal to Unuk River, K-9 Chickamin River to 2722, K-13 Mahoney Mountain. (Table 1). We observed 444 goats in about 10 hours of flying, or 46 goats/hour. The ratio of 15 kids per 100 adults was lower than previous counts.

During fall 2000 we completed aerial surveys in the following TCAs: K-3 Rudyerd Bay to Smeaton Arm, K-4 Wilson Arm to Boca de Quadra, K-6 Cleveland Peninsula, K-12A Mirror Lake to Swan Lake, K-12B Swan Lake/Mt. Reid, K13 Deer Mountain to Mahoney Peak, and K-14 South end of Boca de Quadra to Portland Canal (Table 1). We observed 435 goats in about 7 survey hours. Our observation rate of 61 goats/hour was up from the previous year, and the highest enumeration rate since 1990. However, this rate is well below the long-term 20-year average of 79 goats per hour. The 2000 ratio of 22 kids/100 adults was well below the 10-year average (\bar{x} = 28:100). The high kid count near Mahoney Peak suggests good reproduction in that introduced herd.

We observed a notable increase in the number of goats in TCA K-12A where we also counted the highest kid to adult ratio on record. K-13 is one of 2 areas where goats were introduced, which also had a high kid to adult ratio, indicating good recruitment (Table 2). It appears that the introduced populations are continuing to grow. TCA K-11 had the lowest count since 1993 and no kids were noted during the 1997 survey. Kids may easily be missed during surveys and the aerial count numbers likely represent only a portion of the total young of the year. Kids are hidden behind adults or vegetation and consequently counts represent a minimum estimate. We believe goat populations elsewhere in the subunit remained relatively stable during this report period.

Population Size

Results of aerial mountain goat surveys can only be interpreted as minimum population values (Ballard 1975). We developed population estimates for goats inhabiting Unit 1A using survey data (ADF&G Unpubl. rep., 1990, Ketchikan) and the sightability correction factor developed by Smith and Bovee (1984). To derive our estimate, we first delineated the percentage of each Wildlife Analysis Area (WAA) that we believed contained suitable goat habitat. We then applied our survey-derived estimate of 1.27 goats/mi² to these percentages, which resulted in a mainland estimate of 7,300–10,200 goats (ADF&G Unpubl. rep., 1990, Ketchikan). In the absence of any new information, we believe this estimate is the best available for Unit 1A goat numbers.

Population Composition

The 1999 and 2000 surveys resulted in an overall productivity estimate for Unit 1A of 15 and 22 kids/100 adults, respectively (Table 1). The ratios are not directly comparable to overall productivity in Unit 1A because different areas were surveyed each year. Productivity varied among TCAs from 5–40 kids per 100 adults during this report period.

Distribution and Movements

Radio collars from the previous introductions to Unit 1A are no longer transmitting and no new goats have been captured to provide additional movement or distribution data. Two female goats from the original introduction site near Mahoney Peak were still carrying radio collars and eartags during observations in 2000 and 2001 and appear to be in good health, considering both nannies are now between 15 and 18 years of age. Unfortunately the tag numbers have worn off making them unreadable and hence unidentifiable.

MORTALITY

Season and Bag Limit

Unit 1(A), Revillagigedo
Island, except that
portion west of Carroll
Inlet and Creek, west of
the divide between
Carroll Creek and the
south fork of Orchard
Creek, south of Orchard
Creek, Orchard Lake,

Resident and nonresident hunters

Aug. 1–Dec. 31

Shrimp Bay, and Gedney
Pass

1 goat by registration
permit only

Unit 1A, remainder of
Revillagigedo Island

No open season.

Remainder of Unit 1(A)

Aug. 1–Dec. 31

2 goats by registration
permit only

Board of Game Actions and Emergency Orders. During fall 2001 we issued an emergency order closure for goat hunting on the Cleveland Peninsula, including subunits 1A and 1B south of a line between Sunny Bay and Yes Bay. Goats here are distributed over a large area and occur in very small, isolated groups. The nature of the landscape makes emigration of goats from other areas highly unlikely. Goats on the Cleveland Peninsula have historically occurred at low densities, and harvest during the past several years has reduced numbers even lower. Wildlife biologists conducted several aerial surveys of this area during September and October, 2001. Low counts during these surveys and data from the past 4 years raise concerns about the health and viability of this goat population. Between 1995 and 2000 hunters harvested a total of 15 goats from this area, including 6 females. Biologists believe that continuing the general hunting season in this area is not warranted due to the low number of goats, and the harvest of any additional goats could be detrimental to the population. Smith and Raedeke (1982) described the vulnerability of this isolated goat population on the Cleveland Peninsula, the fragmented habitat, and the potential for periodic local extinction.

Hunter Harvest. (Table 3) One hundred seventy-four permits and 154 permits were issued for Unit 1A during 1999 and 2000, respectively. Of these, 80 permittees actually hunted during 1999 and 68 hunted during 2000. During the 1999 season, no hunters killed 2 goats, and during the 2000 season 2 hunters killed 2 goats. Thus, 9 hunters killed 9 goats in 1999 and 18 hunters killed 20 goats during the 2000 season. The harvest of 9 goats in 1999 was the lowest on record, and likely resulted from extremely poor weather during the entire season. Hunters' ability to get into the field was hampered by persistent low clouds and poor visibility.

During average years the majority of the goat harvest is split between August and September, with a few taken during October depending on weather patterns. During 1999 and 2000 the harvest was more evenly distributed over the prime 3 months; during the 2000 season 3 goats were harvested during December.

Permit Hunts. Goat hunting in Unit 1A has been regulated by registration permits for the past 19 years. During 1982–1993, a second permit was available for hunters who killed a goat and returned their first hunt report. Just prior to the 1994 season this was changed so that hunters can now harvest up to 2 goats during a single hunt in most of the subunit. Hunters that kill 2 goats during the same year are treated as separate hunters.

Hunter Residency and Success. Hunters from all residency categories harvested the fewest goats on record from Unit 1A during 1999. Two nonresidents hunted goats successfully in Unit 1A during 1999, and 11 nonresidents killed goats during 2000, the highest nonresident harvest since 1988 (Table 4). Forty-four and 33% of the 1999 and 2000 harvests, respectively, were by hunters residing within the subunit. Alaska residents composed 77% and 60% of the 1999 and 2000 harvest, respectively. Overall hunter success during 1999 was 14%, and in 2000 was 49% (Table 4).

Harvest Chronology. Unlike recent years where the majority of goat harvests have occurred during September, the 1999 harvest was split between August and September with 13 goats taken during each month (Table 5). During the 2000 season, 3 goats were also taken in December. There appears to be an increasing interest in late season goat hunt hunting in Southeast Alaska.

Transport Methods. Airplanes accounted for 78% and 75% of the transportation used by successful hunters during the past two seasons (Table 6). Airplanes accounted for 78% of the transportation used by hunters during the past 5 seasons (range 73–83%). The balance of Unit 1A hunters used boats to access hunting areas. Many alpine lakes in this area make it possible for hunters to land floatplanes and begin their hunt above timberline near goat habitat.

Other Mortality

Cyclic and unpredictable weather and healthy predator populations, including black and brown bears and wolves, are believed to be more influential than hunting in modifying the subunit's goat populations. Bears kill young or very old goats during a portion of the year, while wolves are capable of preying on all age classes of animals during the entire year. When deep snows displace goats from alpine and subalpine habitats, they are more vulnerable to predation as they seek refuge at lower elevations in old-growth forest where food and escape habitat is much more limited. Deer numbers are low throughout most of Unit 1A, leaving goats as alternative prey for wolves. Avalanches and snow slides also account for some goat mortality during years of heavy snowfall. No evidence of orf or other disease was observed during this report period.

CONCLUSIONS AND RECOMMENDATIONS

As a result of state legislation that took effect in 1989, all nonresident goat hunters are required to be accompanied by a registered guide or by an Alaska resident over 19 years of age who is within the second degree of kindred. This law has markedly reduced nonresident participation in the unit's goat hunting. However, at least 3 registered guides have established use areas within the unit, and we anticipate increased nonresident hunter participation. A total of 14 nonresidents hunted goats in Unit 1A and 11 of those were successful. This is the highest number of nonresident hunter's during any season since the inception of the guide requirement.

The 1991 Upper Mahoney Lake goat introduction appears to have been a success. Productivity remains high and the herd has increased from the original 15 to at least 87 goats in fall 2001. We have established a trend count area in the vicinity of Deer Mountain/Upper Mahoney Lake (K-13), which we will periodically survey along with the other TCAs in the unit. We anticipate going to the BOG in fall 2002 with a proposal to open the season in this area to a limited number

of drawing permits. We intend to ask the board to eliminate the 2-goat bag limit, and we are considering a request to close the Cleveland Peninsula to all goat hunting.

Mountain goat populations appear to be stable throughout most of Unit 1A. Several areas we will be watching closely are the Cleveland Peninsula and Yes Bay. These 2 adjacent areas south of the Bradfield Canal will be surveyed annually during the next few years. Recent low counts around Yes Bay/Reflection Lake on the northern Cleveland Peninsula are probably the result of predation and over-browsing of winter habitat rather than hunter harvest. High productivity observed during recent surveys suggests that the population in the Yes Bay area may be slowly rebounding. Our objective of maintaining goat densities greater than 20 goats per hour of survey time has consistently been met.

In February 2002, Region I Division of Wildlife Conservation wildlife managers met in Ketchikan to review existing goat management objectives. As a result of that meeting, revised objectives will be put in place for the region.

LITERATURE CITED

- FOSTER, B.R. 1982. Observability and habitat characteristics of the mountain goat (*Oreamnos americanus* Blainville, 1816) in west-central British Columbia. M.Sc. Thesis Univ. of B.C. 134 pp.
- FOX, J.L. 1983. Constraints on winter habitat selection by the mountain goat (*Oreamnos americanus*) in Alaska. Ph.D. Thesis. Univ. of Wash. 147 pp.
- FRID, A. 1997. Human disturbance of mountain goats and related ungulates: A literature-based analysis with applications to Goatherd Mountain. Boreal Research Associates, Site 20, Comp. 357, RR 1, Whitehorse, YT. Final Report.
- HERBERT, D.M. AND W.G. TURNBULL. 1977. A description of southern interior and coastal mountain goat ecotypes in British Columbia. Pages 126–146. In: W. Samuel and W.G. MacGregor (eds.) Proc. First Intl. Mtn. Goat Symp. Kalispell, Mont. 243 pp.
- LARSEN, D. N. 1996. Mountain goat survey-inventory management report. Pages 1–13 in M. V. Hicks, ed. Mountain Goat. Alaska Dep. Fish and Game. Fed. Aid in Wildl. Rest. Manage. Rep. Grants W-24-2, W-24-3. Study 12.0. Juneau. 152 pp.
- NICHOLS, L. 1980. Aerial census and classification of mountain goats in Alaska. Proc. North. Wild. Sheep and Goat Council. 2:523–540.
- SCHOEN, J.W. AND M.D. KIRCHHOFF. 1982. Habitat use by mountain goats in Southeast Alaska. Final Report. Fed. Aid in Wildl. Rest. Proj. W-17-10, W-17-11, W-21-2, Job 12.4 R. Alaska Dept. Fish and Game, Juneau, Alaska. 67 pp.
- SMITH, C. A. 1983. Habitat use by mountain goats in Southeast Alaska. Prog. Report. Fed. Aid in Wildl. Rest. Fed. Aid. In Wildl. Rest. Proj. W-22-2, Job 12.4 R. Alaska Dept. Fish and Game. Juneau, Alaska. 14 pp.

- SMITH, C. A. 1984. Evaluation and management implications of long-term trends in coastal mountain goat populations in Southeast Alaska. Pages 395–424 *in* Proc. Fourth Bien. Symp. of North Wild Sheep and Goat Counc. M. Hoefs, ed. Whitehorse, Canada.
- AND K. T. BOVEE. 1984. A mark-recapture census and density estimate for a coastal mountain goat population. Pages 487–498 *in* Proc. Fourth Bien. Symp. of North. Wild Sheep and Goat Counc. M. Hoefs, ed. Whitehorse, Canada.
- AND L. NICHOLS, JR. 1984. Mountain goat transplants in Alaska: Restocking depleted herds and mitigating mining impacts. Pages 467–480 *in* Proc. Fourth Bien. Symp. of North. Wild Sheep and Goat Counc. M. Hoefs, ed. Whitehorse, Canada.
- AND K.J. RAEDEKE. 1982. Group size and movements of a dispersed, low-density goat population, with comments on inbreeding and human impacts. Bienn. Symp. North. Wild. Sheep and Goat Counc. 3:54–67.

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Table 1 Unit 1A mountain goat survey data, 1968–2000

Survey dates ^a	Nr of kids	Nr of adults	<i>TOTAL GOATS</i>	Kids-100 adults	Count time (hrs.)	Goats/hour
Aug. 20–Sept. 18, 1968	162	553	715	29	4.9	146
Sept. 1–Sept. 16, 1971	111	357	468	31	3.9	120
Aug. 16–Sept. 16, 1973	35	149	184	23	2.5	74
Aug. 27–Sept. 21, 1974	14	50	64	28	1.8	35
Aug. 12–Sept. 11, 1975	84	270	354	31	7.6	46
Sept. 1–Sept. 11, 1976	73	283	356	26	8.0	44
Aug. 31–Sept. 6, 1977	165	354	519	47	6.3	82
Sept. 5–Sept. 9, 1978	126	404	530	31	5.2	102
Sept. 18–Sept. 21, 1979	62	238	300	26	3.8	79
Aug. 20–Sept. 12, 1980	215	617	832	35	9.6	87
Aug. 26–Sept. 21, 1981	153	461	614	33	6.0	102
Aug. 29–Sept. 18, 1982	167	515	682	32	6.9	99
Aug. 30–Sept. 23, 1983	177	658	835	27	7.5	111
Sept. 5–Sept. 24, 1984	174	666	840	26	7.1	118
Sept. 9–Sept. 26, 1985	75	311	386	24	3.3	117
Sept. 12–Sept. 15, 1986	64	359	423	18	4.0	106
Sept. 23–Oct. 8, 1987	39	182	221	21	2.0	110
Sept. 3–Sept. 19, 1988	104	304	408	34	4.4	93
Sept. 10–Sept. 13, 1989	124	415	539	30	5.5	98
Sept. 6–Oct. 3, 1990	193	603	796	32	9.3	85
Aug. 30–Sept. 5, 1993	47	163	210	29	6.8	31
Sept. 8–Oct. 1, 1994 ^b	81	414	495	19	8.8	56
Aug. 28–Sept. 4, 1995	55	290	345	19	8.7	40
Sept. 3–Sept. 30, 1996	112	309	421	36	10.6	40
Sept. 9–Sept. 29, 1997	147	551	698	37	12.0	46
Sept. 13–Sept. 21, 1998	102	450	552	40	10.4	53
Sept. 12–Sept. 27, 1999	56	377	423	15	7.8	44
Aug. 23–Oct. 4, 2000	79	356	435	22	7.1	61

^aMost comparable data is from 1975–2000.

^bIncludes a 48 minute survey of the Deer Mountain/Upper Mahoney Lake introduced population on September 8. Fourteen adults and 4 kids were observed
Table 2 Unit 1A mountain goat trend count area surveys, 1980–2000

<i>SURVEY</i>	<i>Year</i>	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
<i>AREA</i>								
K-3	2000	60	13	73	1.5	48	22	0
	1999	114	13	127	1.5	85	9	0
	1995	105	28	133	2.0	66	26	0
	1982	26	10	36	0.5	72	38	3
	1980	42	11	53	1.5	35	26	0
K-4	2000	73	10	83	1.0	83	14	2
	1999	29	6	35	.9	38	21	0
	1998	65	17	82	1.2	68	26	1
	1997	78	24	102	1.1	93	31	1
	1994	49	10	59	1.1	54	20	0
	1993	21	6	27	0.6	45	28	0
	1990	71	26	97	0.9	108	37	3
	1989	59	19	78	0.9	87	32	1
	1988	17	4	21	0.7	30	24	0
	1987	69	17	86	0.8	107	25	0
	1985	24	3	27	0.9	30	13	0
	1984	76	22	98	0.9	109	29	2
	1983	88	26	114	1.1	104	30	5
	1982	64	23	87	1.0	87	36	0
	1981	68	27	95	0.8	119	40	4
	1980	35	18	53	0.7	76	51	1
K-5	2000	14	3	17	1.0	17	21	0
	1999	149	16	165	1.3	127	11	2
	1998	158	36	194	2.0	97	23	3

Table 2 continued

<i>SURVEY AREA</i>	<i>Year</i>	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
	1997	283	71	354	1.9	186	25	2
	1994	189	40	229	2.5	92	21	1
	1990	153	46	199	2.0	99	30	2
	1989	59	19	78	0.9	87	32	1
	1988	93	29	122	1.3	94	31	0
	1986	148	24	172	1.2	143	16	1
	1985	99	21	120	1.0	120	21	0
	1984	153	46	199	1.5	133	30	1
	1983	173	47	220	2.0	110	27	2
	1982	118	48	166	1.6	104	41	5
	1981	145	47	192	1.8	107	32	5
	1980	116	35	151	2.1	72	30	4
K-6								
	1997	18	7	25	1.7	15	39	0
	1996	18	6	24	1.5	16	33	0
K-7								
	1999	46	12	58	1.9	31	26	0
	1998	43	6	49	2.0	25	14	0
	1997	49	12	61	2.3	26	24	0
	1996	65	25	90	2.5	36	38	1
	1995	22	2	24	2.2	11	9	0
	1994	82	12	94	2.6	36	15	0
	1993 ^a	68	18	86	2.5	34	26	0
	1990	166	62	228	2.0	114	37	2

Table 2 continued

<i>SURVEY AREA</i>	<i>Year</i>	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
	1984	117	30	147	1.8	82	26	0
	1983	131	37	168	1.8	93	28	1
	1980	128	36	164	1.8	91	28	2
K-8								
	1997	46	15	61	2.2	28	33	0
	1982 ^b	52	13	65	0.7	89	25	0
K-9								
	1999	29	3	32	1.5	21	10	0
	1998	17	4	21	1.9	11	24	0
	1996	44	12	56	1.7	33	27	0
	1995	47	6	53	1.7	31	13	0
	1993 ^a	48	20	68	2.2	31	42	1
	1990	81	22	103	1.5	69	27	1
	1989	94	33	127	1.4	91	35	2
	1988	119	46	165	1.3	127	39	1
	1986	106	21	127	1.4	91	20	0
	1985	92	24	116	1.1	105	26	1
	1984	138	19	157	1.4	112	14	0
	1983	146	37	183	1.6	114	25	0
	1982	104	25	129	1.3	99	24	0
	1981	100	39	139	1.8	77	39	4
	1980	158	66	224	1.8	124	42	4

Table 2 continued

<i>SURVEY</i>	<i>Year</i>	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
<i>AREA</i>								
K-10								
	1998	20	3	23	1.1	21	15	0
	1996	52	14	66	1.2	55	27	0
	1994	63	10	73	1.4	52	16	0
	1993 ^a	21	3	24	1.2	20	14	0
	1990	86	22	108	0.9	120	26	2
	1989	66	13	79	1.1	72	20	0
	1988	70	23	93	0.9	103	33	0
	1987	92	18	100	1.0	100	20	0
	1986	75	12	87	1.1	79	16	0
	1985	120	30	150	1.1	136	25	2
	1984	150	47	197	1.2	164	31	2
	1983	88	26	114	1.0	114	30	5
	1982	99	26	125	1.2	104	26	2
	1981	119	33	152	1.2	127	28	1
	1980	116	42	158	1.5	105	36	4
K-11								
	1997	6	0	6	0.3	20	0	0
	1996	12	2	14	0.3	47	17	0
	1995	20	2	22	0.3	73	10	1
	1994	17	5	22	0.4	55	29	1
	1993 ^a	5	0	5	0.2	25	0	0
	1990	15	2	17	0.3	57	13	0
	1989	21	4	25	0.4	62	19	0
	1987	21	4	25	0.3	83	19	0

Table 2 continued

<i>SURVEY AREA</i>	<i>Year</i>	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
	1986	30	7	37	0.3	123	23	0
	1984	32	10	42	0.4	105	31	1
	1982	20	8	28	0.2	140	40	0
	1981	29	7	36	0.3	120	24	0
	1980	22	7	29	0.3	97	32	1
K-12A	2000	26	7	37	0.8	32	19	0
	1998	27	12	39	0.5	78	44	1
	1996	18	5	23	0.8	31	28	0
	1995	32	4	36	0.7	51	12	0
	1992	27	7	34	0.4	79	26	0
K-12B	2000	76	21	87	1.2	41	28	0
	1998 ^b	62	12	74	1.3	57	19	0
	1996	74	35	109	1.6	68	47	6
	1995	64	13	77	1.8	43	20	1
	1992	35	15	50	1.5	33	43	3
	1991	18	7	25	--	--	39	--
	1990	20	9	29	1.1	26	45	2
	1988	29	14	43	1.2	36	33	2
K-13 ^e								
	1998	46	13	59	0.8	79	28	1
	1997	35	13	48	1.1	44	37	1

Table 2 continued

<i>SURVEY</i>	<i>Year</i>	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
<i>AREA</i>								
	1996	26	13	39	1.0	39	50	0
	1994	14	4	18	0.8	23	28	0

^a Extended hot weather suspected of keeping goats in low-elevation shade.

^b Incomplete survey.

^c Swan Lake introduced population.

^d Surveys were done using a Bell 206 Jet Ranger helicopter.

^e Upper Mahoney Lake introduced population.

Table 3 Unit 1A mountain goat harvest data by permit hunt, regulatory years 1985 through 2000

Hunt	Regulatory year	Permits issued ^a	Did not hunt	Unsuccessful hunters	Successful hunters	Harvest						Total harvest
						Males	(%)	Females	(%)	Unk	(%)	
RG001	1985–1986	261	122	88	51	29	(57)	22	(43)	0	(0)	51
	1986–1987	244	122	71	51	16	(31)	33	(65)	2	(4)	51
	1987–1988	195	107	61	27	14	(52)	3	(48)	0	(0)	27
	1988–1989	202	78	78	33	14	(42)	19	(58)	0	(0)	33
	1989–1990	182 ^b	87	66	23	14	(16)	9	(39)	0	(0)	23
	1990–1991	208 ^c	91	76	20	14	(70)	6	(30)	0	(0)	20
	1991–1992	245 ^d	127	80	16	10	(63)	5	(31)	1	(6)	16
	1992–1993	246	120	76	23	17	(74)	6	(26)	0	(0)	23
	1993–1994	299	197	52	33	20	(61)	13	(39)	0	(0)	33
	1994–1995 ^c	215	135	55	20 ^f	11	(55)	9	(45)	0	(0)	20
	1995–1996	201	112	54	24 ^g	14	(58)	10	(42)	0	(0)	24
	1996–1997	171	91	48	22	14	(64)	8	(36)	0	(0)	22
	1997–1998	177	82	51	36 ^h	17	(47)	19	(53)	0	(0)	36
	1998–1999	205 ^b	91	65	33 ⁱ	20	(61)	13	(39)	0	(0)	33
	1999–2000	174	94	56	9	5	(56)	4	(44)	0	(0)	9
	2000–2001	154	86	31	24 ^f	14	(58)	10	(42)	0	(0)	24

^aTotal permits issued does not include the Unit 1B portion of the hunt and exceeds the total for “did not hunt”, “unsuccessful hunters”, and “successful hunters” categories.

^b One permit not returned.

^c Three permits not returned.

^d Four permits not returned.

^e Regulation changed; hunters could take 2 goats during a single hunt.

^f Two hunters killed two goats (18 hunters killed 20 goats).

^g One hunter killed two goats (23 hunters killed 24 goats).

^h Five hunters killed two goats (31 hunters killed 36 goats).

ⁱ Four hunters killed two goats (29 hunters killed 33 goats).

Table 4 Unit 1A mountain goat hunter residency and success, regulatory years 1985 through 2000

Regulatory year	Successful					Unsuccessful					Total hunters
	Local ^a resident	Nonlocal resident	Nonresident	Total	(%)	Local ^a resident	Nonlocal resident	Nonresident	Total	(%)	
1985–1986		30	21	51	(37)		67	21	88	(63)	139
1986–1987		39	12	51	(42)		48	23	71	(58)	122
1987–1988	15	0	12	27	(31)	44	3	14	61	(69)	88
1988–1989	19	0	14	33	(33)	35	0	31	66	(67)	99
1989–1990	18	4	1	23	(26)	49	16	1	66	(74)	89
1990–1991	17	3	0	20	(20)	75	6	0	81	(80)	101
1991–1992	15	1	0	16	(17)	73	7	0	80	(83)	96
1992–1993	17	5	1	23	(23)	67	8	1	76	(77)	99
1993–1994	29	4	0	33	(39)	50	2	0	52	(61)	85
1994–1995	15	3	2	20	(27)	45	9	1	55	(73)	75
1995–1996	18	6	0	24	(31)	38	14	2	54	(69)	78
1996–1997	14	8	0	22	(31)	30	15	3	48	(69)	70
1997–1998	24	10	2	36	(41)	40	8	3	51	(59)	87
1998–1999	21	8	4	33	(34)	51	10	4	65	(66)	98
1999–2000	4	3	2	9	(14)	41	6	9	56	(86)	65
2000–2001	9	7	11	27	(49)	24	4	3	31	(51)	58

^a Local and nonlocal residents combined during 1985 and 1986. Local resident hunters reside in Unit 1A.

Table 5 Unit 1A goat harvest chronology percent by month, 1985 through 2000

<i>REGULATOR Y YEAR</i>	Aug	(%)	<i>SEPT</i>	(%)	Oct	(%)	Nov	(%)	Dec	(%)	Unk	(%)	<i>n</i>
1985–1986	7	(14)	25	(49)	15	(29)	0	(0)	4	(8)	0	(0)	51
1986–1987	8	(16)	30	(59)	4	(8)	1	(2)	8	(16)	0	(0)	51
1987–1988	9	(33)	8	(30)	6	(22)	3	(11)	1	(4)	0	(0)	27
1988–1989	8	(24)	19	(58)	5	(15)	1	(3)	0	(0)	0	(0)	33
1989–1990	4	(17)	7	(31)	4	(17)	3	(13)	5	(22)	0	(0)	23
1990–1991	9	(45)	8	(40)	2	(10)	1	(5)	0	(0)	0	(0)	20
1991–1992	5	(31)	3	(19)	4	(25)	1	(6)	3	(19)	0	(0)	16
1992–1993	7	(31)	6	(26)	6	(26)	4	(17)	0	(0)	0	(0)	23
1993–1994	5	(15)	15	(46)	9	(27)	0	(0)	4	(12)	0	(0)	33
1994–1995	1	(5)	13	(65)	6	(30)	0	(0)	0	(0)	0	(0)	20
1995–1996	3	(13)	19	(79)	2	(8)	0	(0)	0	(0)	0	(0)	24
1996–1997	5	(23)	15	(68)	2	(9)	0	(0)	0	(0)	0	(0)	22
1997–1998	13	(36)	13	(36)	7	(20)	3	(8)	0	(0)	0	(0)	36
1998–1999	8	(25)	12	(36)	11	(33)	1	(3)	1	(3)	0	(0)	33
<i>1999–2000</i>	5	(56)	2	(22)	2	(22)	0	(0)	0	(0)	0	(0)	9
<i>2000–2001</i>	4	(17)	7	(29)	9	(38)	1	(4)	3	(12)	0	(0)	24

Table 6 Unit 1A mountain goat harvest percent by transport method, regulatory years 1985 through 2000

Regulatory year	Harvest percent by transport method								<i>n</i>
	Airplane	Air (%)	Boat	Boat (%)	Dog sled	Sled (%)	Unk	Unk.(%)	
1985–1986	46	(90)	5	(10)	0	(0)	0	(0)	51
1986–1987	42	(82)	9	(18)	0	(0)	0	(0)	51
1987–1988	17	(63)	10	(37)	0	(0)	0	(0)	27
1988–1989	28	(85)	5	(15)	0	(0)	0	(0)	33
1989–1990	11	(48)	12	(52)	0	(0)	0	(0)	23
1990–1991	12	(60)	8	(40)	0	(0)	0	(0)	20
1991–1992	8	(50)	8	(50)	0	(0)	0	(0)	16
1992–1993	20	(87)	3	(13)	0	(0)	0	(0)	23
1993–1994	23	(70)	10	(30)	0	(0)	0	(0)	33
1994–1995	14	(70)	6	(30)	0	(0)	0	(0)	20
1995–1996	21	(88)	3	(12)	0	(0)	0	(0)	24
1996–1997	18	(82)	2	(9)	2	(9)	0	(0)	22
1997–1998	30	(83)	6	(17)	0	(0)	0	(0)	36
1998–1999	24	(73)	9	(27)	0	(0)	0	(0)	33
1999–2000	7	(78)	2	(22)	0	(0)	0	(0)	9
2000–2001	18	(75)	6	(25)	0	(0)	0	(0)	24

SPECIES MANAGEMENT REPORT

Alaska Department of Fish and Game
DIVISION OF WILDLIFE CONSERVATION
PO BOX 25526
JUNEAU, AK 99802-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 1B (3,000 mi²)

GEOGRAPHIC DESCRIPTION: Southeast Alaska mainland, Cape Fanshaw to Lemesurier Point.

BACKGROUND

HABITAT DESCRIPTION

ADF&G does not have an estimate for the amount of suitable goat habitat in Unit 1B. About 850 square miles is comprised of forest habitat, some of which serves as important goat winter range, particularly during periods of severe winter weather.

Mountain goats in Southeast Alaska use alpine, subalpine and some heavily forested habitats (Fox 1983, Schoen and Kirchhoff 1982, Smith 1985), typically in proximity to steep escape terrain that provides security from predators. Considered generalist feeders (Dailey et al. 1984), goats take advantage of a wide variety of plant types for food (Geist 1971, Adams and Bailey 1983).

In spring, goats occupy avalanche chutes and low elevation south facing slopes where they forage on alder, rhizomes, and new shoots of ferns. As snow melts in the summer, goats move to high elevation alpine and subalpine habitats where they feed on newly exposed and highly nutritious sedges and forbs (Schoen et al. 1989).

During winter, goats in the colder mainland areas of Southeast Alaska occupy steep or windswept slopes with little snow cover, while those in the warmer coastal areas typically descend to forest habitats during periods of heavy snowfall. Winter is a period of severe nutritional deprivation and food scarcity for mountain goats (Schoen et al. 1989). Forage availability and selection are influenced to large extent by snowpack depth and density. During winter, goats feed on conifers, mosses, and lichens, and to lesser degree shrubs, forbs, ferns, and grasses (Smith, 1986). As a result of high annual precipitation, the majority of goat winter range in Southeast Alaska is limited to forested habitats. During periods of severe winter weather and heavy snowfall goats may even descend to forested coastal shorelines.

The largest threats to mountain goat habitat are development activities associated with logging, mining, and hydroelectric power (Schoen et al. 1989). To date, an estimated 14,000 acres of forested habitat in the subunit have been logged and are now clearcuts in various stages of seral habitats and include some logging roads. Clearcuts and pole stands are considered poor goat winter habitat and roads can make goats vulnerable to exploitation by increased human access.

HUMAN-USE HISTORY

Mountain goats are indigenous to Unit 1B and are distributed throughout appropriate habitat. They have traditionally been hunted for food and trophies. Information about goats in the subunit is limited to aerial surveys, harvest records, anecdotal public reports, and observations by our staff.

REGULATION HISTORY

Prior to 1975, all Unit 1 subunits were managed under the same goat season and bag limit. Since statehood, season dates varied between August 1 and January 31, and the resident and nonresident bag limit was 2 goats. Since 1973, the Unit 1B goat season has remained August 1 to December 31. In the late 1960s and early 1970s, a succession of severe winters greatly reduced the goat population in the unit. Since 1975, the subunit has been managed separately from the remainder of Unit 1 and the bag limit has fluctuated from 1 to 2 goats.

Since 1980, a registration permit has been required to hunt goats in Unit 1B. From 1991 to the present the subunit has been divided into two separate registration hunts. In RG-001 (formerly #801), that portion of Unit 1B south of the North Fork Bradfield River, there is a 2-goat bag limit. In RG004 (formerly #804), that portion of the unit north of the North Fork Bradfield River, there is a one-goat bag limit.

Due to concerns about a population decline, from 1987 to 1989 the Muddy River, Horn Cliffs, and Le Conte Bay areas were managed via a separate registration hunt (#807). In 1987 and 1988, the bag limit was restricted to one male goat. From 1989 to 1991, the bag limit was changed to one goat of either sex; however, the taking of kids or nannies with kids was prohibited. Although the separate registration hunt for the Horn Cliffs area was abolished in 1991, the regulation prohibiting the taking of kids or nannies with kids remained in affect for that portion of Unit 1B north of the North Fork Bradfield River until 1994.

In July 1989 a law was enacted requiring all nonresident goat hunters to employ the services of a Big Game Guide. Since then, the percentage of goats taken by guided nonresidents has increased annually, with significant increases during the mid to late 1990s.

In 1997, the Federal Subsistence Board made a determination that all rural residents of Units 1B and 3 qualify as subsistence users of goats. In that portion of Unit 1B between LeConte Bay and the North Fork of the Bradfield River, federal regulations require a state permit for the taking of the first goat and a federal registration permit for the taking of a second goat.

Historical harvest patterns

From 1973 to 1997, the Unit 1B harvest averaged 31 goats per year, ranging from a low of 15 goats in 1975, to a high of 50 goats in 1990. In recent years the harvest has remained relatively stable, averaging 31 goats per year for the 10-year period ending in 1998. The overwhelming

majority of the annual harvest occurs in RG004, that portion of the unit north of the North Fork of the Bradfield River.

HARVEST CHRONOLOGY

Annual differences in fall and winter weather conditions have a profound influence on harvest chronology in the subunit. Between 1985 and 1998, most goat harvest during the 5-month season occurred during September and August.

Historical harvest locations

Since 1985 the largest percentage of the Unit 1B goat harvest has occurred in Le Conte Bay, Stikine River, and Thomas Bay, representing 18, 16, and 13 percent of the total harvest, respectively.

Hunters have limited access to most goat habitat in the unit, so hunting pressure tends to be focused near access points. Hunters access goat habitat by hiking up from saltwater, river drainages, or logging roads, or by using floatplanes to fly into the few usable subalpine and alpine lakes in the subunit. The few high elevation lakes suitable for landing aircraft are generally only accessible during the early season before lakes freeze over.

Goats can become increasingly accessible to hunters from saltwater later in the season when snow forces them to lower elevation winter range. In Unit 1B these areas include Le Conte and Thomas bays. Because of increased accessibility and vulnerability to harvest in some areas we monitor the late season harvest closely.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES:

Preliminary management goals are to maintain population levels to accommodate an annual harvest of 35 goats and a 35% hunter success rate.

METHODS

Aerial surveys were flown within established trend count areas to obtain the number of goats and the percentage of kids in the population. We monitored hunter harvest through a registration permit system. All permit holders were required to report and those hunting reported the location and duration of their hunts and/or kills, transportation used, and date and sex of kill. We also recorded anecdotal information from hunters and guides.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Data are insufficient to determine precise goat population trends in Unit 1B. Quantitative information on goat movement patterns and winter diet are limited to a radio telemetry study conducted in Unit 1A and the extreme southern portion of Unit 1B (Smith 1982). Although data are scarce, available information indicates Unit 1B goat populations have remained stable with the exception of the late 1960's and early 1970s when severe winters reduced the herd.

Population Size

Precise population estimates are not available for goats in the subunit. Based a mountain goat habitat capability model (Suring 1993), US Forest Service (USFS) and ADF&G biologists estimated that Unit 1B could support approximately 1,219 goats based on the availability of suitable winter habitat.

Population Composition

Table 1 shows the past 9 years of age composition data from aerial trend counts. Differences in sample size occur because inclement weather frequently makes complete surveys difficult. In the September 1999 and September 2000 surveys, kids composed 21% and 18%, respectively, of the goats classified. Annual differences in survey coverage, and uncertainties about the sightability of goats during aerial surveys, make it difficult to estimate abundance.

Distribution and Movements

Southeast Alaska mountain goats occur on most mainland ridge complexes. Goat distribution Information in the subunit is limited to observations made during aerial surveys, observations by staff, and anecdotal reports from the public. Although widely distributed across the subunit, in some areas goats are notably absent or present in small numbers despite the availability of apparently suitable habitat.

Goats typically occupy subalpine and alpine habitats from spring until fall. Depth and duration of snow cover can significantly influence winter movements of goats. In winter goats use windblown or steep slopes with little snow cover, or descend to low elevation forested areas during deep snow periods.

There appear to be sex-linked differences in movements and home range size (Smith 1982) in Southeast goats. Males moved between major ridge complexes, whereas females remained on ridges where they were captured. Inter-ridge movement by males appears to be associated with the rut and contributed to relatively large winter home ranges. Inter-ridge movements by males may be important for preventing problems associated with inbreeding.

During spring, goats generally moved to lower elevation, south-facing rock cliffs, brush, and forest habitats, presumably to take advantage of new green vegetation. Throughout the summer, goats dispersed to a variety of habitat types with an increase in elevation and greater use of northerly exposures. During fall, goats moved down in elevation but still utilized north-facing exposures and inhabited forest, alpine, subalpine, and cliff habitats. Throughout winter goats utilized a wide range of elevations, concentrating at mid-elevations and southern exposures on alpine and rock-cliff habitats with less forested habitat. However, goats substantially utilize steep, broken terrain throughout the year (Schoen 1979).

MORTALITY

Harvest

Season and bag limit

Unit 1B, that portion
north of Bradfield Canal
and the north fork of the

Resident and nonresident hunters

Aug. 1–Dec. 31
(General hunt only)

Bradfield River

*1 goat by registration
permit only*

Remainder of Unit 1B

*Aug. 1–Dec. 31
(General hunt only)*

*2 goats by registration
permit only*

Board of Game Actions and Emergency Orders. Although Board of Game action was not required, prior to the fall 2000 hunting season we shortened the reporting period for successful goat hunters to 5 days region wide, under discretionary permit hunt requirements. No Board of Game actions were taken and no emergency orders were issued during the report period.

Hunter Harvest. The 1999 and 2000 Unit 1B harvests of 24 and 27 goats, respectively, were below our management goal of 35 goats (Table 2). Hunter success was 32% in 1999 and 36% in 2000, slightly below and slightly above the management goal of 35 percent, respectively. Males comprised 67% of the harvest in both years. The sex of harvested goats was obtained from registration hunt reports and was not verified by checking hunter kills. We distributed literature designed to help hunters identify male goats in the field and encouraged them to select males.

In recent years, interest in Southeast Alaska goat hunting by nonresident hunters has increased, and because of the guide requirement, we are seeing an associated increase in harvest by guided nonresident hunters. The number of guided hunts increased in RG004 from 3 in 1992 to a high of 16 in 2000. The number of goats harvested by guided hunters during this period increased from just 1 in 1992, to 9 and 8, respectively, in 1999 and 2000.

No federal subsistence permits to harvest a second goat were issued during this report period.

Hunter Residency and Success. Petersburg and Wrangell residents continue to represent the largest group of hunters and harvest the majority of goats taken in the subunit (Table 3). Local residents also represent the largest group of unsuccessful hunters.

During this report period, local residents had 32% success, nonlocal residents 22% success, and guided nonresidents 40% success. Different success rates between local residents, nonlocal residents, and nonresidents are due primarily to lack of effort by many locals rather than differences in hunting skills between groups. Many local hunters hunt primarily from the beach during the late season, hoping for an easy opportunity to harvest a goat. The overall success rate for those permittees who hunted was 32 and 36%, respectively, in 1999 and 2000.

From 1992 to 1998, the success rate for guided hunters in RG004 ranged from 25 to 83%, and averaged 54%. During this report period the guided hunter success rate was 70 and 50%, respectively, in 1999 and 2000. Because of the guide requirement, nonresident hunters typically enjoy the highest success rate.

Harvest in Particular Areas. Goat harvest occurred in 13 Unit 1B Wildlife Analysis Areas (WAAs) during this report period. In 1999, harvest occurred in 8 WAAs, with #1706 providing 38% of the subunit's total annual harvest. The remainder of the harvest was evenly distributed across the remaining 7 WAAs. In 2000, harvest occurred in 11 WAAs with #1605 and #1706 each accounting for 22% of the total kill. The remainder of the harvest was evenly distributed across the remaining 9 WAAs.

Harvest Chronology. Winter weather, particularly during the late season, can have a profound influence on harvest chronology. The greatest proportion of the 1999 harvest occurred in August and December. The highest percentage of the 2000 harvest occurred in December, followed by identical harvests in September and November (Table 4). In 2000, the proportion of the annual harvest taken in December surpassed that of any other month for the first time.

Prior to 1998, the highest proportion of the harvest traditionally occurred in September and August. In recent years there appears to have been a shift from early to late season effort. Although this may reflect recent winter weather conditions, it may also be attributable to an increasing hunter desire to either harvest goats with prime winter pelage, or to take advantage of easy hunting opportunities.

Transport Methods. In 1999 and 2000, 67 and 70%, respectively, of successful hunters accessed their hunting area by boat; the remainder used airplanes, with just 1 hunter using another transportation method (Table 5). The increased percentage of hunters using boats to access hunting areas may reflect a shift toward late season hunts when subalpine lakes are frozen and inaccessible by airplane.

Other Mortality

Although we received no reports of goat mortality unrelated to hunting, other sources of mortality can include predation by wolves, bears, and bald eagles, malnutrition, disease, and injury or death as a result of mishaps and avalanches.

In fall 2000, a guide photographed an adult nanny at Horn Cliffs that was severely infected with contagious ecthyma, commonly called "orf". Orf is a virus that causes blisters and scabs to form on the body of infected animals, primarily affecting the head, mainly the lips, mouth, nose, eyelids, and ears. The virus is spread by direct contact with scabs on infected animals, but can also be contracted through direct contact with scabs that have fallen to the ground. The disease can be fatal but no mortalities were documented in the unit as a result of the disease during this report period. Goats displaying symptoms of orf have been occasionally reported in the Horn Cliffs area in the past.

HABITAT

Assessment

Timber harvest and the resulting destruction of winter range continue to pose the most serious threat to goat habitat in the unit. Roads associated with logging increase hunter access and can make goats increasingly vulnerable to harvest. Department staff routinely review, and comment on, proposed timber sales in an attempt to minimize the effects of logging on important goat winter range.

Enhancement

No habitat enhancement projects for goats have been attempted in the unit.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Currently the results of aerial goat surveys can only be interpreted as minimum population estimates. Annual goat surveys performed only once in a trend count area may not accurately reflect population and composition trends (Ballard 1975). Variables that influence survey results are numerous and for the most part unquantifiable. Uncertainty about the sightability of goats during aerial surveys remains a primary concern. Research is needed to develop reliable methods of inventorying Southeast Alaska goat populations.

During the last two years we have witnessed a significant increase in the number of USFS guide use and service day requests for goat hunting on the 1B mainland. Recent USFS moratoriums imposed on the number of brown bear Big Game Guides and hunters in Units 1 and 4 may have resulted in increased interest in goat guiding.

In June 2001 a meeting was held between USFS permitting authorities, ADF&G, and Unit 1B goat guides to discuss recent increases in both the number of guides and the number of hunt requests for Guide Use Area 01-06. Of particular concern was the potential for localized overharvest and crowding. Guides provided information on the number of clients booked for fall 2001 and the anticipated timing and planned location of scheduled hunts. We will continue to monitor the goat harvest by guided hunters closely.

CONCLUSIONS AND RECOMMENDATIONS

During this report period the goat harvest was below the management objective of 35 goats annually and below the average annual harvest of 31 goats annually during the preceding 10-year period. Hunter success during 1999 and 2000 was slightly below and slightly above, respectively, the management objective of 35%.

We are increasingly concerned about the steady increase in the number of guides, the total number of guided hunts, and the number of goats killed by guided nonresident hunters. Because of the high profitability of goat guiding, many guides restricted from brown bear hunts in the unit are turning their attention toward goat hunts as an alternative source of income.

In recent years the subunit has experienced a shift from early to late season goat harvests. Because of the increased vulnerability of goats during the late season, and concerns about localized overharvest in areas easily accessible from saltwater, we will continue to monitor the harvest carefully, particularly during the late season.

Based on aerial survey data and hunter reports, goat populations appear stable in Unit 1B. Hunting pressure is generally low and tends to be concentrated in areas with easy access. Given recent increases in guided and late season hunts, the goat population and harvest will be monitored closely. Although preliminary at this time, we are considering proposals to the fall 2002 BOG to eliminate the 2-goat bag limit in southern Unit 1B, as well as a drawing permit hunt for nonresident hunters.

In February 2002, Region I Division of Wildlife Conservation wildlife managers met in Ketchikan to review existing goat management objectives. As a result of that meeting, revised objectives will be put in place for the region.

LITERATURE CITED

- ADAMS, L. G., AND J. A. BAILEY. 1982. Population dynamics of mountain goats in the Sawatch Range, Colorado. *Journal of Wildlife Management*. 46(4):1003–1009.
- BALLARD, W. B. 1975. Mountain goat survey technique evaluation. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Final Report. Project W-17-7, Job12.2R. Juneau, Alaska, USA. 152pp.
- DAILEY, T. V., N. T. HOBBS, AND T. N. WOODWARD. 1984. Experimental comparisons of diet selection by mountain goats and mountain sheep in Colorado. *Journal of Wildlife Management*. 10: 799–806.
- FOX, J. L., C. A. SMITH, AND J. W. SCHOEN, 1989. Relation between mountain goats and their habitats in Southeastern Alaska. Gen. Tech. Rep. PNW-GTR-246. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 25p.
- GEIST, V. 1971. Mountain sheep – a study in behavior and evolution. University of Chicago Press, Chicago, Ill. 383 pp.
- SMITH, C. 1982. Habitat use by mountain goats in Southeast Alaska. Alaska Dep. of Fish and Game. Fed. Aid in Wildl. Rest. Progress Report. Project W-21-2, Job 12.4R. 22pp.
- SMITH, C. 1986. Habitat use by mountain goats in southeast Alaska. Alaska Dep. of Fish and Game. Fed. Aid in Wildl. Rest. Final Report. Project W-21-1, W-22-2 and W-22-3, Job 12.4R. 63pp.
- SCHOEN, J. 1979. Winter habitat use by mountain goats. Alaska Dept. of Fish and Game. P-R Progress Report. 52pp.
- SCHOEN J. W. AND M. D. KIRCHHOFF. 1982. Habitat use by mountain goats in Southeast Alaska. Alaska Department of Fish and Game. Final Report. Federal Aid in Wildlife Restoration. Project W-17-10, W-17-11, W-21-1, W-21-2, Job12.4R. Juneau, Alaska, USA. 67pp.
- SURING, L. H. 1993. Habitat capability models for wildlife in Southeast Alaska. USDA Forest Service, Alaska Region, Juneau. n. s.

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Table 1 Unit 1B summer aerial mountain goat composition counts, regulatory years 1991–2000

Regulatory year ^a	Adults	(%)	Kids	(%)	Unknown	Kids: 100 adults	Total goats observed	Goats /hour
1991	67	(83)	14	(17)	0	21	81	35
1992	117	(70)	50	(30)	0	43	167	72
1994 (Aug. 1994)	90	(74)	31	(26)	0	34	121	35
1994 (June 1995)	339	(94)	21	(6)	0	6	360	32
1996 (Sept. 1996)	59	(74)	21	(26)	0	36	80	52
1997 (Sept. 1997)	144	(87)	21	(13)	0	15	165	73
1998	0	(0)	0	(0)	0	0	0	0
1999 (Sept. 1999)	65	(79)	17	(21)	0	26	82	29
2000 (Sept. 2000)	14	(82)	3	(18)	0	21	17	17

^a Different portions of the unit are flown in different years; data not directly comparable.

Table 2 Unit 1B mountain goat harvest data by permit hunt, regulatory years 1993 through 2000

Hunt No.	Year	Permits ^a issued	Nr hunted	(%) Did not hunt	Nr successful hunters	(%) successful hunters	Nr males	(%) males	Nr Females	Total harvest
RG001	1993		18		11	(61)	5	(45)	6	11
	1994		6		6	(100)	1	(17)	5	6
	1995		11		6	(54)	3	(50)	3	6
	1996		10		1	(10)	0	(0)	1	1
	1997		8		5	(63)	5	(100)	0	5
	1998		15		4	(27)	3	(75)	1	4
	1999		15		2	(13)	2	(100)	0	2
	2000		13		4	(31)	4	(100)	0	4
RG004	1993	147	66	(55)	25	(38)	19	(76)	6	25
	1994	144	80	(44)	28	(35)	19	(68)	9	28
	1995	125	59	(52)	22	(40)	20	(90)	2	22
	1996	147	60	(59)	21	(35)	15	(71)	6	21
	1997	156	70	(55)	28	(40)	21	(75)	7	28
	1998	119	45	(62)	16	(36)	13	(81)	3	16
	1999	139	60	(57)	22	(37)	14	(64)	8	22
	2000	127	63	(50)	23	(37)	14	(61)	9	23
Combined	1993		84		36	(43)	24	(67)	12	36
	1994		86		34	(40)	20	(59)	14	34
	1995		70		28	(40)	23	(82)	5	28
	1996		80		22	(31)	15	(68)	7	22
	1997		78		33	(42)	26	(79)	7	33
	1998		60		20	(33)	16	(80)	4	20
	1999		75		24	(32)	16	(67)	8	24
	2000		76		27	(36)	18	(67)	9	27

^a Number of permits issued for 1B in hunt number RG001 is unknown because this hunt includes part of Unit 1A.

Table 3 Unit 1B mountain goat hunter residency and success, regulatory years 1993 through 2000

Year	Successful					Unsuccessful					Total hunters
	Local ^a resident	Nonlocal resident	Nonresident	Total	(%)	Local ^a resident	Nonlocal resident	Nonresident	Total	(%)	
1993	18	16	2	36	(44)	32	13	1	46	(56)	82
1994	21	7	6	34	(40)	35	5	10	50	(60)	84
1995	10	9	9	28	(42)	27	8	3	38	(58)	66
1996	8	7	7	22	(32)	27	12	6	45	(67)	67
1997	20	8	5	33	(42)	30	10	5	45	(58)	78
1998	9	5	6	20	(33)	31	7	2	40	(67)	60
1999	15	1	8	24	(33)	32	14	4	50	(67)	75
2000	12	6	9	27	(36)	26	11	12	49	(64)	76

^a Residents of Petersburg, Wrangell, and Kake.

Table 4 Unit 1B mountain goat harvest chronology, percent by month, regulatory years 1993 through 2000

Year	Month										Total harvest
	August		September		October		November		December		
	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)	
1993	9	(25)	15	(41)	9	(25)	1	(3)	2	(6)	36
1994	11	(32)	8	(24)	8	(24)	2	(6)	5	(15)	34
1995	7	(25)	12	(43)	5	(18)	2	(7)	2	(7)	28
1996	10	(45)	6	(27)	3	(13)	2	(9)	1	(6)	22
1997	16	(49)	5	(15)	5	(15)	4	(12)	3	(9)	33
1998	6	(30)	1	(5)	5	(25)	5	(25)	3	(15)	20
1999	7	(29)	4	(17)	2	(8)	5	(21)	6	(25)	24
2000	4	(15)	6	(22)	3	(11)	6	(22)	8	(30)	27

Table 5 Unit 1B mountain goat harvest, percent by transport methods, regulatory years 1993 through 2000

Percent of harvest							
Year	Airplane		Boat		Other		Total harvest
	n	(%)	n	(%)	n	(%)	
1993	20	(56)	16	(44)	0	(0)	36
1994	22	(65)	12	(35)	0	(0)	34
1995	21	(75)	7	(25)	0	(0)	28
1996	12	(54)	9	(40)	1	(6)	22
1997	11	(33)	22	(67)	0	(0)	33
1998	9	(45)	11	(55)	0	(0)	20
1999	8	(33)	16	(67)	0	(0)	24
2000	7	(26)	19	(70)	1	(4)	27

SPECIES MANAGEMENT REPORT

Alaska Department of Fish and Game
DIVISION OF WILDLIFE CONSERVATION
PO BOX 25526
JUNEAU, AK 99802-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 1C (7600 miles²)

GEOGRAPHIC DESCRIPTION: The Southeast Alaska mainland and the islands of Lynn Canal and Stephens Passage lying between Cape Fanshaw and the latitude of Eldred Rock, including Sullivan Island and the drainages of Berners Bay.

BACKGROUND

Mountain goats arrived in Southeast Alaska from southern refugia sometime after the retreat of Pleistocene glaciation (Chadwick, 1983). Because mountain goats utilize alpine and subalpine zones in the summer and the upper reaches of coniferous forests in the winter, the coastal mountains of British Columbia and Alaska have promoted range expansion rather than acted as a barrier. Mountain goats now inhabit most of the coastal range of Southeast Alaska where steep forested slopes broken by rock outcrops are common.

Because they are popular with local and nonlocal hunters, mountain goat populations in easily accessible areas have been reduced from historic levels during the 1970's and early 1980's. In addition to hunting pressure, severe winter weather conditions and an outbreak of contagious ecthyma (orf) reduced goat numbers, resulting in unit-wide declines. Low goat numbers near the Juneau road system prompted the Board of Game (BOG) to close the area between the Taku Glacier and Eagle Glacier/River prior to the 1984 season. This was followed by a closure of the area south of the Endicott River on the west side of Lynn Canal in 1996. To boost goat numbers near Juneau, mountain goats from the Whiting River were reintroduced to Mount Juneau in summer 1989. All of these goats, individually marked prior to release, apparently left the area by 1992. In spite of this, goats reestablished themselves in the vicinity of Juneau, and are now routinely seen on nearly all local mainland mountains. This resurgence resulted in the BOG adopting a proposal in 1998 to allow an archery-only goat hunt between Pt. Salisbury and the Taku Glacier. The goat populations in other areas in Unit 1C have also rebounded, including the area on the west side of Lynn Canal, resulting in the BOG reopening this area in 1996.

There are two main issues of concern regarding mountain goat management in Unit 1C – guided hunting and tourism. Although goats are distributed throughout the Unit 1C mainland, hunting efforts are usually concentrated in areas where access is relatively easy. Because of this, guided hunts in Tracy and Endicott arms have become a major factor in the Unit 1C goat harvest. This is one of few areas in the world where hunters may stay in comfort aboard large boats and make day hunts for goats along steep cliffs lining fiords. This use predominates late in the season, when snow often forces goats to lower elevations. The competition by guides for goat hunts in this area is increasing each year, and will eventually force ADF&G to deal with this high nonresident harvest by shortening the season, changing to a drawing hunt, or some other system to keep the nonresident harvest within acceptable limits.

Since their origin in the early 1980's, helicopter flightseeing tours have become the signature adventure for cruise ship tourists while visiting Juneau. The number of helicopter landings on the Juneau icefields has risen from just a few thousand during the early years of operation to nearly 19,000 in the late 1990's. What effects these overflights have on mountain goat populations are unknown, but concerns about negative influences of this industry on goats are becoming widespread.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Population management objectives identified by staff for Unit 1C are as follows:

1. Maintain goat densities so at least 30 goats per hour are seen during fall surveys from Eagle River/Glacier to the Antler River and in the Chilkat Range; and
2. Maintain goat densities so at least 50 goats per hour are seen during fall surveys south of Taku Inlet.

METHODS

Harvest data were obtained from registration permit hunt reports for the 1999 and 2000 fall hunts. Population surveys were conducted in a small portion of Unit 1C during the report period.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Information on Unit 1C mountain goat populations was gathered from aerial surveys and hunters' comments. Mountain goat populations seem to be at medium to high densities over most of the hunted range, based on the number of goats seen per hour as well as the general numbers seen during aerial surveys (Table 1). Aerial population surveys were conducted in the following locations: Pt. Salisbury to the Taku Glacier (registration hunt RG014); the south side of the Taku River from Lake Dorothy to Turner Lake; and the west side of Lynn Canal from the Endicott River to Pt. Couverdon. Sighting rates and the ratio of kids to adults were both within the range of previous surveys (Table 1). In areas that were not surveyed during this report period, we used hunter effort and success as well as previous survey information as an indicator of population status. The goat population on the mountains adjacent to Juneau appears to be increasing, and

sightings are becoming routine above town, as well as on Mt. Roberts and up the Sheep Creek valley.

MORTALITY

Harvest

Season and bag limits

Resident and nonresident hunters

Unit 1(C), that portion draining into Lynn Canal and Stephens Passage between Antler River and Eagle Glacier and River, and all drainages of the Chilkat Range south of the south bank of the Endicott River

Oct. 1–Nov. 30

1 goat by registration permit only

Unit 1C, that portion

No open season.

draining into Stephens Passage between Eagle Glacier and River and Point Salisbury

Unit 1(C), that portion draining into Stephens Passage and Taku Inlet between Point Salisbury and Taku Glacier

Oct. 1–Nov. 30
(General hunt only)

1 goat by registration permit by bow and arrow only

Remainder of Unit 1C

Aug. 1–Nov. 30

1 goat by registration permit only

Board of Game Actions and Emergency Orders. In fall 2000 the BOG adopted a proposal to change the season for goat hunting on the west side of Lynn Canal, south of the Endicott River. This opening date for this area was changed from October 1 to September 1. Similarly, the BOG changed the season opening date for goat hunting in RG014 (an archery only hunt) from October 1 to September 1.

Hunter Harvest. A total of 77 goats were taken during this report period, 38 in 1999 and 39 in 2000 (Table 2). The average annual harvest decreased by 3 goats over the preceding 2-year period. Males again made up a large part of the harvest (82%), which is substantially higher than the 71% male harvest during the previous report period. The predominantly male harvest resulted from guided hunts within the area. Registered guides are adept at differentiating male from female goats, and guided hunters prefer a male goat because of its trophy status. Also, guides are

aware that females are counted more heavily than males against harvest guidelines, and that it is in their interest to restrict their hunters to taking billies. Because we do not require hunters to present goats for sealing, the reported harvest of male goats may be inflated, as hunters are sometimes reluctant to admit to killing a nanny.

Harvest was concentrated in three wildlife analysis areas (WAA's) during the report period (Table 7). One of these (2518) is in the upper Taku River and access to the area is by floatplane to an alpine lake. The other two areas (2824 and 2825) are in Tracy and Endicott arms. Both of these areas are accessible by boat and bear the brunt of Unit 1C commercial guiding operations.

Permit Hunts. Registration permit hunts RG012, RG013, and RG014 are incorporated under a single permit. The number of permits issued increased from a mean of 159 in the previous report period, to a mean of 185 in 1999–2000 (Table 3). In spite of this rather large increase in the number of permits issued, the mean annual number of hunters (n=77) remained about the same as during the previous report period (n=74). Compliance with reporting requirements has been good, but we continue to resort to reminder letters and certified reminder letters to get information from some hunters.

Hunter Residency and Success. The success rate of all hunters averaged 50% during this report period, compared to 57% during 1997–98. Although local resident hunters harvested nearly as many goats during in 1999 and 2000 as non-residents (33 vs. 39, respectively), their average success rate was only 38% compared to 85% for non-resident hunters (Table 4). This is a reflection of nonresidents being required by statute to hunt with a guide, and the fact that most guides are better equipped to hunt goats than the average local resident hunter. The percentage of goats taken by nonresidents (50%) increased slightly from the previous report period (46%), but the number of goats harvested by nonresidents remained at 39. Successful hunters expended an average of 2.8 days per goat during the report period, a level above the mean of 2.5 days per goat during 1997–98 (Table 3). Unsuccessful hunters also expended an average of 2.8 days in the field.

Harvest Chronology. The November harvest continued to be the highest of the 4-month season, accounting for 72% of the take in 1999 and 68% in 2000. The preponderance of late season kills reflects the availability of goats at lower elevations and hunter desire to take an animal in winter pelage.

Transport Methods. Boats have historically been the primary means of transportation for successful goat hunters in the unit. This trend continued during the report period, with 86% of successful hunters using them (Table 5). Other means of transportation included airplanes and highway vehicles. Highway vehicles were used along the Juneau road system.

Commercial Services. The use of commercial services remained about the same as the previous report period, with 51% of hunters using a commercial service versus 44% during 1997–98. Seventy percent of hunters who used commercial services used a guide, and 29% used commercial transportation to the field. This is not surprising since most huntable areas are only accessible by airplane or boat. The commercial service used most often by resident hunters was transportation, whereas all nonresidents used a registered guide as required by law.

Other Mortality

There is little data available concerning natural mortality. Holroyd (1967) cited several instances of goats killed in falls, rockslides, and avalanches. Wounding loss may be responsible for additional deaths, but we have not gathered data related to this cause.

HABITAT

Assessment

Unit 1C winter and summer goat range is extensive and goat numbers are probably below carrying capacity in most parts of the subunit. Helicopter traffic in or near goat habitat is probably the biggest concern at this time. There is a steady increase in demand for both summer flightseeing tours as well as winter heliskiing opportunities. Little is known about the effects of helicopter noise on goat populations. Goats may be displaced from preferred habitat areas because of these disturbances that could ultimately play a role in population declines due to reduced fitness. Because of these concerns, US Forest Service land managers and ADF&G have been discussing methods of addressing these concerns through a study funded by the USFS, but with input by ADF&G staff.

CONCLUSIONS AND RECOMMENDATIONS

Aerial surveys were completed in three areas. Although management objectives regarding aerial surveys south of the Taku River were not met, this is not cause for alarm as the lower sighting rate is likely the result of a small area being surveyed. Efforts will be made during the next report period to gather more survey information in this area. A survey of the Chilkat Range south of the Endicott River enumerated 36 goats per hour, surpassing the management objective of 30 goats/hour. As weather and funding permit, aerial surveys should be conducted to determine population trends throughout the unit. We intend to define discrete trend count areas, which will provide data that is more comparable year to year.

Hunter effort and success was lower than the preceding report period. In both years of this report period hunters predominantly killed males. Although the percentage of nannies in the kill was low during the report period, continued emphasis should be placed on directing hunting pressure away from females. Harvest guidelines established for each permit hunt area will continue to be used and should further encourage hunters to select males.

The Chilkat Range south of the Endicott River, reopened in fall 1998, received little hunting pressure and no goats were harvested there during this report period. The season opening date of October 1 in this area may be restrictive to local hunters due to deteriorating weather late in the year. We intend to propose that the BOG open this season at an earlier date to increase hunter effort.

In February 2002, Region I Division of Wildlife Conservation wildlife managers met in Ketchikan to review existing goat management objectives. As a result of that meeting, revised objectives will be put in place for the region.

LITERATURE CITED

HOLROYD, J. C. 1967. Observations of rocky mountain goats on Mount Wardle, Kootenay National Park, British Columbia. Can. Field-Nat. 81:1-22.

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SUBMITTED BY:

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Management Coordinator

Table 1 Unit 1C mountain goat composition counts south of the Taku River, regulatory years 1986 through 2000

Year	Number adults	Number kids	Total goats	Kids:100 adults	Percent kids	Goats per hour
1986	192	55	247	29	22	42
1987			No survey			
1988	81	26	107	32	24	26
1989	514	169	683	33	25	51
1990-92			No survey			
1993 ¹	171	4	175	2	2	17
	62	15	77	25	19	77
1994	370	79	449	21	18	82
1995			No survey			
1996 ²	215	78	293	36	27	52
1997			No survey			
1998 ³	225	38	263	20	14	77
	71	19	90	27	21	39
1999 ⁴	54	12	66	22	18	33
2000 ⁵	57	3	60	5	5	47
	143	30	179	48	17	36

¹ The first survey was conducted from a boat in early May at Tracy and Endicott arms. The second survey, conducted from a PA-18 aircraft in October, was done in the Kensington Mine area.

² Survey included all goat habitat in the Chilkat Range outside of Glacier Bay National Park, from Sullivan Is. to the southern end of the Chilkat Mts.

³ The first survey was from Eagle River and Glacier to the Lace River. The second survey was from Pt. Salisbury to the Taku Glacier (RG014 bow and arrow only hunt area).

⁴ Registration hunt area RG014.

⁵ The first survey was conducted at Lake Dorothy south of the Taku River. The second survey was conducted in the Chilkat Range over the course of 2 days.

Table 2 Unit 1C annual goat harvest, regulatory years 1990 through 2000

Year	Males	Females	Unknown	Total
1990	19	10	1	30
1991	14	8	0	22
1992	27	12	0	39
1993	35	12	0	47
1994	36	6	0	42
1995	25	7	0	32
1996	24	8	3	35 ¹
1997	30	14	2	46
1998	30	6	2	38
1999	28	10	0	38
2000	35	3	1	39

¹ Three of these goats were taken illegally.

Table 3 Unit 1C goat hunter effort and success, regulatory years 1990 through 2000

Year	Permits issued	<u>Successful hunters</u>			<u>Unsuccessful hunters</u>			<u>Total hunters</u>		
		Nr hunters	Total days	Avg. days	Nr hunters	Total days	Avg. days	Nr hunters	Total days	Avg. days
1990	140	30	82	2.7	25	57	2.5	55	139	2.7
1991	145	22	48	2.2	41	114	2.8	63	162	2.6
1992	151	39	124	3.2	35	74	2.1	74	198	2.7
1993	157	47	135	2.9	50	136	2.7	97	271	2.8
1994	168	42	114	2.7	41	132	3.2	83	246	3.0
1995	146	32	111	3.5	44	134	3.0	76	245	3.2
1996	135	35	101	2.9	21	42	2.0	56	143	2.6
1997	164	46	118	2.7	35	70	2.0	81	188	2.3
1998	153	38	85	2.2	29	88	3.0	67	173	2.6
1999	190	38	97	2.6	40	104	2.6	78	201	2.6
2000	180	39	122	3.1	37	89	2.5	76	211	2.9

Table 4 Unit 1C goat hunter success by community of residence, regulatory years 1990 through 2000

Year	Percent success	Successful hunters			Unsuccessful hunters		
		Unit resident	Other AK	Non resident	Unit resident	Other AK	Non resident
1990	55	16	4	10	20	4	1
1991	35	14	3	5	34	4	3
1992	53	22	5	12	27	8	0
1993	48	22	4	21	40	7	3
1994	51	16	3	23	29	7	5
1995	43	12	2	18	36	5	2
1996	63	11	4	20	18	4	0
1997	57	22	4	20	30	4	1
1998	57	17	2	19	24	3	2
1999	49	17	3	18	29	8	3
2000	51	16	2	21	24	9	4

Table 5 Unit 1C transport methods used by successful goat hunters, regulatory years 1990 through 2000

Year	Airplane		Boat		Foot		Hwy. vehicle		Other	
	Total	(%)	Total	(%)	Total	(%)	Total	(%)	Total	(%)
1990	2	(7)	26	(87)	2	(7)	0	(0)	0	(0)
1991	3	(14)	19	(86)	0	(0)	0	(0)	0	(0)
1992	7	(18)	32	(82)	0	(0)	0	(0)	0	(0)
1993	7	(17)	35	(85)	1	(2)	4	(10)	0	(0)
1994	9	(21)	31	(74)	0	(0)	2	(5)	0	(0)
1995	6	(19)	25	(78)	0	(0)	0	(0)	1	(3)
1996	4	(12)	26	(79)	0	(0)	3	(9)	0	(0)
1997	10	(22)	34	(74)	1	(2)	1	(2)	0	(0)
1998	6	(16)	32	(84)	0	(0)	0	(0)	0	(0)
1999	5	(13)	32	(84)	0	(0)	0	(0)	1	(3)
2000	5	(13)	34	(87)	0	(0)	0	(0)	0	(0)

Table 6 Commercial services used by Unit 1C goat hunters, regulatory years 1991 through 2000

Year	Unit residents		Other AK residents		Nonresidents		Total use		Registered guide	Transporter	Other
	No	Yes	No	Yes	No	Yes	No	Yes			
1991	21	3	1	1	0	7	22	11	5	6	0
1992	38	4	6	2	2	10	46	16	7	9	0
1993	36	14	4	4	2	21	42	39	21	17	1
1994	38	4	7	1	1	27	46	33	28	4	0
1995	35	7	9	1	0	20	44	28	20	8	0
1996	20	3	5	2	0	19	25	24	20	4	0
1997	37	9	5	3	0	21	42	33	21	12	0
1998	28	5	5	0	0	21	33	26	21	4	1
1999	28	9	6	2	0	21	34	32	24	7	0
2000	25	11	8	2	0	25	33	38	25	13	0

Not all hunters report commercial services used

Table 7 Unit 1C mountain goat harvest from all Wildlife Analysis Areas (WAA's), regulatory years 1990 through 2000

WAA	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
2202			1			2						3
2203		2		1			1	3	1			8
2304												-
2305									1			1
2306												-
2307												-
2408	1					2		1		1		5
2409			1			3	1	2			1	8
2410				2	1		1	3				7
2411					1	1		3		1		6
2412	1	1	1									3
2413							1	2	3			6
2514	2							1	2			5
2515								1				1
2517											1	1
2518	3	3	5	6	1	4	2	4	2	2	6	38
2519					1	1			2	1		5
2722												-
2823	3		1	3	4							11
2824	2	7	16	14	23	15	17	15	19	20	18	166
2825	9	3	8	10	7	7	8	8	8	13	11	92
2926			3	7	2	1						13
2927			1	4	2		3	3			2	15
Unkn	9	6	2	0	0	0	0	0	0	0	0	17
TOTAL	30	22	39	47	42	36	34	46	39	38	39	411

SPECIES MANAGEMENT REPORT

Alaska Department of Fish and Game
DIVISION OF WILDLIFE CONSERVATION
PO BOX 25526
JUNEAU, AK 99802-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 1D (2700 mi²)

GEOGRAPHIC DESCRIPTION: The Southeast Alaska mainland north of the latitude of Eldred Rock, excluding Sullivan Island and the drainages of Berners Bay.

BACKGROUND

There are three separate registration permit hunts with separate hunt areas in Unit 1D (RG023, RG024, and RG026). Also, the Skagway area hunt is bounded by the Taiya River, the Yukon and White Pass Railroad, and the Canadian border and has been closed to goat hunting since 1985, where the allowable harvest became difficult to maintain, with the season closing the same day it opened. Aerial composition counts conducted between 1983 and 1995 indicated that this population had not recovered despite the closure. Based on aerial survey information, mountain goat populations appear to be fairly healthy in the remainder of the subunit.

Hundertmark et. al. (1983) examined winter habitat use by mountain goats in the Chilkat Valley. They suggested that the increased access afforded by timber and mineral development would increase hunting pressure and illegal harvest. This added pressure on goats was considered detrimental to goat populations as is habitat loss resulting from logging and mining.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Population management objectives identified by staff for Unit 1D goats are as follows:

1. Skagway closed area - Increase population to 100 animals;
2. Unit 1D north of Klehini/Chilkat River and Katzechin River - Increase estimated population from 600 to 1,000 goats. Maintain hunter success of 25%;

3. Unit 1D south of Klehini/Chilkat River and Katzehin River - Increase estimated population from 300 to 500 goats. Maintain hunter success of 25%; and
4. Conduct aerial surveys in areas of concentrated harvest at least every 3 years.

METHODS

Both ADF&G and Bureau of Land Management (BLM) personnel conducted aerial surveys within the subunit during 1999 and 2000. Results from BLM surveys, though not directly comparable to ADF&G data due to different survey aircraft and methodology, are still useful. A common registration permit was used to administer hunts RG023, RG024, and RG026. Harvest parameters, including hunter effort and success rates, were determined for each hunt.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

With only occasional unstandardized surveys flown under a variety of conditions, mountain goat population status in Unit 1D is difficult to evaluate. Survey results vary from year to year for most areas (Tables 1a, b, and c). Some of these variations are undoubtedly due to the intensity and scope of the surveys in any given area. Although some differences within an area's survey results are related to survey conditions, the degree to which any one survey is influenced is unknown. We augment ADF&G survey results with BLM data to provide a more comprehensive evaluation of the Unit 1D goat population.

Historical data suggest that hunting pressure has the potential to reduce goat numbers rapidly in easily accessible areas, such as the Skagway hunt area (Table 1a). Despite the closure, recovery of goats in this area has apparently been slow. In hunt area RG023 a portion of the Takshanuk Mountains borders the Haines Highway. Because other areas in northern Southeast Alaska have exhibited low goat population growth even after several years of hunting closure, these highly accessible areas merit yearly monitoring.

Population Composition

We did not conduct any population estimates during this report period. Rather, we use our surveys to monitor population trends and kid-to-adult ratios in certain areas. We concentrated our effort in the main harvest areas (Taiya Inlet and Takshanuk Mountains) and one location where a hydroelectric project may be initiated. Based on the overall number of goats, percent of kids, and number of goats seen per hour of survey time, the goat population appears healthy (Tables 1a, b, and c).

MORTALITY

HARVEST

Season and bag limits

Unit 1D, that portion between

Resident and nonresident hunters

No open season.

Taiya Inlet and River and the
White Pass and Yukon Railroad

Unit 1D, that portion north and
east of the Chilkat River, south
of the Canadian border, and south
and west of the Ferebee River
and Glacier

Sept. 15–Nov. 15
(General hunt only)

1 goat by registration permit only

Unit 1D, that portion north of the
Haines Highway and west of the
Chilkat River, between the
Ferebee River and Glacier and
Taiya River and Inlet, and be-
tween the White Pass and Yukon
Railroad and the Katzechin River

Sept. 1–Nov. 30
(General hunt only)

1 goat by registration permit only

Remainder of Unit 1D

Aug. 1–Dec. 31
(General hunt only)

1 goat by registration permit only

Board of Game action and Emergency Orders. Although Board of Game action was not required, prior to the fall 2000 hunting season, we shortened the reporting period for successful goat hunters to 5 days region wide, under discretionary permit hunt requirements. Emergency orders were issued in 1999 and 2000 to close the eastern portion of the RGO24 area, which borders Taiya Inlet.

Hunter Harvest. A total of 47 goats were harvested during the report period, 25 in 1999 and 22 in 2000 (Table 2). The 1999 harvest consisted of 10 males and 15 females, compared to the 2000 harvest of 13 males and 9 females. The 2000 harvest was lower than the average annual harvest of 24 for the preceding six years and 25 for the last 11 years. However, the 1999 harvest was close to or equal to those averages (Table 2).

Permit Hunts. Unit 1D mountain goat hunting is regulated under 3 registration permit hunts, administered by a common hunt report. The main reason for maintaining 3 hunts in the subunit is to allow different opening and closing dates while attempting to adjust for relative differences in hunting pressure. An average of 166 permits were issued during 1999–2000, compared to a mean of 153 during 1997–1998, and a mean of 165 since 1990.

Hunter Residency and Success. A mean of 26% of goat hunters were successful during the report period (Table 4). This is lower than the 29% mean for 1997–98, and lower than the mean of 30%

during 1990–94, but meets the management objective of 25% hunter success. Local residents continue to comprise the majority of Unit 1D goat hunters. In 1999 and 2000, residents of the subunit took 22 (88%) and 17 (77%) of harvested goats, respectively. In 1999 non-local Alaska residents took 3 of the 25 goats harvested, which compares closely to 3 of 22 in 2000. Only Alaska residents hunted for goats in this Unit in 1999, and in 2000 a total of 6 nonresidents (6%) hunted goats; two of them were successful.

Harvest Chronology. Goats can be hunted in Unit 1D from August 1 through December 31, but the season varies between the three hunt areas. Over the years most goats have been harvested from late September to early November. During this report period 32% of the goats were harvested in November, 34% in October, and 21% in September.

Transport Methods. Boats and highway vehicles continue to be the transport methods used most often by successful hunters, amounting to 55% and 28%, respectively during the report period (Table 5). The high percentage of successful hunters using boats seems related to heavy snows forcing goats down to low elevations along Taiya Inlet, leaving them available to hunters on the water. Frequently, nannies descend lower on the cliffs than billies, increasing the chance for a higher-than-desired female harvest. The high number of nannies taken on the east side of Taiya Inlet resulted in two emergency closures this report period. Some hunters, especially Klukwan residents, walk to their hunting area along the Haines Highway.

Commercial Services. Because most Unit 1D goat hunters are local residents, there is little use of commercial services (Table 6). Most hunters have access to either a highway vehicle or a boat and thus provide their own transportation. During the report period only 7 of 145 hunters used commercial services, and 5 of these were nonresidents who were required by state statute to be accompanied by a guide while goat hunting.

Location of Harvest. Accessibility of mountain goat haunts is likely the most important factor in determining vulnerability of goats to hunters. The Takshanuk Mountains are skirted by the Haines Highway on one side, and this area has consistently borne much of the goat harvest in the unit. The east side of Taiya Inlet, readily accessible by boat, has a similar high level of harvest depending on weather conditions. By establishing point values that discourage the taking of females, we are able to manage areas that are used intensively with increased precision.

CONCLUSIONS AND RECOMMENDATIONS

Finer-scale mountain goat management continues to be necessary in Unit 1D as hunting pressure increases. We will continue to use a single application/report for the 3 hunts in the subunit. Careful population and harvest monitoring is necessary, and emergency closures may be required to avoid excessive harvest. Composition surveys should be conducted annually in high use areas. The Skagway closed area should be surveyed again to assess the possibility of reopening the area to hunting, and if opened would probably be managed with a drawing permit. Finally, permanent trend count areas with well-defined boundaries should be established to enhance comparable surveys from year to year.

As predicted in the last management report, helicopter activities in Unit 1D have increased, as have our concerns about their immediate and long-term effects on mountain goats. There are

currently two heliskiing companies based in Haines, and the area is gaining some renown among aficionados of remote skiing. Flightseeing is expected to expand and as a corollary, the practice of using helicopters to access remote areas for hiking and mountaineering is also expected to increase. Cote's (1996) research concerning mountain goat responses to helicopter activity indicates that we should investigate ways of monitoring these various uses of goat habitat. By sharing information with the BLM, our management of goats in this area will continue to become more effective.

In February 2002, Region I Division of Wildlife Conservation wildlife managers met in Ketchikan to review existing goat management objectives. As a result of that meeting, revised objectives will be put in place for the region.

LITERATURE CITED

COTE, S.D. 1996. Mountain goat responses to helicopter disturbance. Wildl. Soc. Bull. 24(4):681-685.

HUNDERTMARK K. J., W. L. EBERHARDT, AND R. E. BALL. 1983. Winter habitat utilization by moose and mountain goats in the Chilkat Valley. Alaska Dept. of Fish and Game. Final report for the Haines-Klukwan Cooperative Resource Study. 44 pp.

SCHOEN J. W. AND M. D. KIRCHHOFF. 1982. Habitat use by mountain goats in Southeast Alaska. Final Rept. Fed. Aid. Wildl. Restor. Proj. W-17-10, W-17-11, W-21-1, W-21-2, Job 12.4R. Alaska Dept. of Fish and Game, Juneau. 67 pp.

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Table 1a Unit 1D mountain goat composition counts, Skagway closed area, regulatory years 1981–2000

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
1981	73	22	95	30	23	60
1983	26	5	31	19	16	56
1984	27	13	40	48	33	36
1985	29	3	32	10	9	25
1986	13	5	18	38	28	28
1987	7	0	7	0	0	55
1988			No survey			
1989	17	6	23	35	26	35
1990			No survey			
1991			No survey			
1992	1	0	1	0	0	3
1993			No survey			
1994 ¹	11	5	16	45	31	20
1995 ²	21	7	28	33	25	N/A
1996			No survey			
1997			No survey			
1998			No survey			
1999			No survey			
2000			No survey			

¹ Skagway Pass side only, goats/hour is for the entire survey that included a portion of hunt area RG023.

² Includes only the west side of closed area, adjacent to the Taiya River.

Table 1b Unit 1D mountain goat composition counts, hunt areas RG023 and RG024, regulatory years 1990–2000

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
<u>Klukwah Mt. (K) and Ferebee Glacier/River (F) to Chilkoot Inlet</u>						
1989 (K)	26	9	35	35	(26)	60
1993	No survey					
1994 (K,F) ¹	111	21	131	19	(16)	45
1995 ²	52	15	67	29	(22)	89
1996–1997	No survey					
1998	69	23	92	33	(25)	58
1999–2000	No survey					
<u>Takshanuk Mtns. (E, W)</u>						
1989 (E,W)	40	16	56	40	(29)	34
1993 (W)	27	7	35	26	(20)	59
1994 (E,W)	48	5	53	10	(9)	17
1995	19	4	23	21	(17)	N/A
1996–1997	NO SURVEY					
1998	22	6	28	27	(21)	20
1999–2000	NO SURVEY					
<u>North of the Klehini River and West of the Chilkat River</u>						
1989	23	6	29	26	(21)	70
1993	No survey					
1994	58	4	62	7	(6)	69
1995	55	9	64	16	(14)	116
1996–2000	No survey					
<u>East of Ferebee Glacier/River (F), Chilkoot/Taiya Inlet</u>						
1989 (F,C)	39	17	56	44	(30)	40
1992 (F,C)	30	10	40	33	(33)	19
1993	No survey					
1994 (F,C)	119/130	21/33	140/163	18/25	(15/20)	46/59
1995–2000	No survey					
<u>Harding Mountain to upper West Cr., upper Norse R. and Chilkoot Pass</u>						
1995	64	9	73	14	12	50.5
1996–2000	No survey					
<u>Twin Dewey Peaks, Skagway Pass, Warm Pass</u>						
1995	20	6	26	30	(23)	20
1996–2000	No survey					
<u>Katzehin River north to Twin Dewey Peaks</u>						
1994	121	32	153	26	21	102
1995	No survey					
1996	103	26	129	25	20	105
1997	96	15	111	16	14	80
1998–1999	No survey					
2000	97	21	108	22	19	83

¹ First survey listed conducted by the BLM in a PA-18 aircraft; this survey does not overlap with the ADF&G survey.

² Includes only the Chilkoot River side of the mountain range from Klukwah Mt. to Chilkoot Inlet.

Table 1c Unit 1D mountain goat composition counts, hunt area RG026, regulatory years 1988–2000

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
<u>Tsirku River (T) and Takhin Ridge (N,S)</u>						
1983 (T)	67	23	90	34	(26)	29
1985 (S)	41	13	54	32	(24)	69
1987 (N,S)	14	4	18	29	(22)	11
1989 (N,S)	111	33	144	30	(23)	126
1993 (N,S)	100	21	121	21	(17)	112
1994 (T,N,S) ^{1,2}	129	29	156	22	(19)	48
1995–00	<i>No survey</i>					
<u>Remainder of Area West of Chilkat Inlet</u>						
1974	39	3	42	8	7	72
1975	20	9	29	45	31	--- ³
1993	<i>No survey</i>					
1994	184	32	213	17	15	49
1995–00	<i>No survey</i>					
<u>East of Chilkoot Inlet-Katzehin River South</u>						
1993	<i>No survey</i>					
1994	32	10	42	31	24	98
1995–1996	<i>No survey</i>					
1997	5	2	7	40	29	N/A
1998–2000	<i>No survey</i>					

¹ First survey listed conducted by the BLM in a PA-18 aircraft.² Survey consisted of a significantly larger area than previous surveys represented.³ Survey time not available.

Table 2 Unit 1D annual mountain goat harvest, regulatory years 1988–2000

Year	Males	Females	Unknown	Total
1990	18	12	1	31
1991	18	5	2	25
1992	9	11	3	23
1993	15	8	2	25
1994	12	12	1	25
1995	14	8	0	22
1996	12	8	0	20
1997	15	12	0	27
1998	20	6	1	27
1999	10	15	0	25
2000	13	9	0	22

Table 3 Unit 1D mountain goat hunter effort and success, regulatory years 1990–2000

Year	Successful hunters				Unsuccessful hunters			Total hunters		
	Permits issued	Nr hunters	Total days	Avg nr days	Nr hunters	Total nr days	Avg nr days	Nr hunters	Total nr days	Avg nr days
1990	193	31	56	1.8	71	116	1.6	102	172	1.7
1991	154	25	36	1.5	48	115	2.5	73	151	2.2
1992	130	23	35	1.5	47	115	2.4	70	150	2.1
1993	182	25	54	2.2	67	158	2.5	92	212	2.4
1994	171	25	64	2.6	79	168	2.3	104	232	2.4
1995	169	22	36	1.7	81	226	2.9	103	262	2.7
1996	176	20	32	1.6	75	152	2.2	95	184	2.1
1997	149	27	46	1.7	60	125	2.4	87	171	2.2
1998	157	27	64	2.6	69	168	2.6	96	230	2.6
1999	170	25	40	1.6	60	175	2.9	85	215	2.7
2000	161	22	48	2.2	73	172	2.4	96	222	2.3

Table 4 Unit 1D goat hunter success by community of residence, regulatory years 1990–2000

Year	<u>Successful hunters</u>				<u>Unsuccessful hunters</u>		
	Percent success	Unit resident	Other AK	Non-resident	Unit resident	Other AK	Non-resident
1990	30	20	9	2	60	11	0
1991	34	21	4	0	32	16	0
1992	33	21	2	0	38	8	1
1993	27	17	6	2	51	16	0
1994	24	15	9	1	54	25	0
1995	21	13	7	2	61	20	0
1996	21	14	3	3	51	21	3
1997	31	15	11	1	45	14	1
1998	28	24	2	1	58	8	3
1999	29	22	3	0	38	22	0
2000	23	17	3	2	54	16	4

Table 5 Unit 1D transport methods used by successful goat hunters, regulatory years 1990–2000

Year	Airplane		Boat		Foot		Hwy vehicle		Other ¹	
	Total	(%)	Total	(%)	Total	(%)	Total	(%)	Total	(%)
1990	0	(0)	17	(55)	5	(16)	7	(23)	2	(6)
1991	0	(0)	13	(57)	1	(4)	9	(39)	0	(0)
1992	0	(0)	9	(41)	7	(32)	5	(23)	1	(5)
1993	3	(12)	12	(48)	0	(0)	8	(32)	2	(8)
1994	0	(0)	15	(60)	3	(12)	7	(28)	0	(0)
1995	1	(5)	8	(36)	0	(0)	11	(50)	2	(9)
1996	0	(0)	8	(44)	5	(28)	5	(28)	0	(0)
1997	0	(0)	7	(26)	5	(19)	13	(48)	2	(7)
1998	0	(0)	12	(46)	5	(19)	7	(27)	2	(8)
1999	0	(0)	18	(72)	3	(12)	3	(12)	1	(4)
2000	0	(0)	8	(26)	3	(14)	10	(45)	1	(5)

¹ Includes unknown transportation

Table 6 Unit 1D commercial services reported by goat hunters, regulatory years 1991–2000

Year	Unit residents		Other AK residents		Non-residents		Total use		Registered guide	Transporter	Other
	No	Yes	No	Yes	No	Yes	No	Yes			
1991 ¹	18	2	7	0	0	0	25	2	0	0	2
1992	48	0	9	0	0	0	57	0	0	0	0
1993	57	2	14	0	2	0	73	2	0	1	1
1994	64	0	28	1	0	1	92	2	1	1	0
1995	67	0	22	3	0	2	89	5	2	3	0
1996	56	0	19	1	0	4	75	5	4	1	0
1997	51	0	20	3	0	3	71	6	3	1	2
1998	77	0	10	0	0	4	87	4	4	0	0
1999 ²	56	2	21	1	0	0	77	3	1	1	1
2000 ³	69	0	19	0	1	4	89	4	4	0	0

¹ Only 37% of hunters reported whether they used, or did not use, commercial services in 1991.² Six percent of hunters did not report whether they used commercial services in 1999.³ Three percent of hunters did not report whether they used commercial services in 2000.

Table 7 Unit 1D Goat harvest by Wildlife Analysis Areas (WAA), regulatory years 1990 through 2000

Regulatory year	WAA							<i>Total</i>
	4302	4303	4304	4405	4406	4407	4408	
1990	16	2	0	5	0	7	1	32
1991	13	2	0	3	0	4	3	25
1992	13	1	0	5	0	3	1	23
1993	11	5	0	4	1	1	3	25
1994	13	1	0	6	0	4	1	25
1995	14	0	0	0	0	3	1	18
1996	8	0	0	0	4	5	3	20
1997	16	5	0	1	0	5	0	27
1998	17	2	0	0	0	5	3	27
1999	7	0	0	2	0	12	4	25
2000	10	2	0	1	0	9	0	22

SPECIES MANAGEMENT REPORT

Alaska Department of Fish and Game
DIVISION OF WILDLIFE CONSERVATION
PO BOX 25526
JUNEAU, AK 99802-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999

To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: Unit 4 (5800 mi²)

GEOGRAPHIC DESCRIPTION: Admiralty, Baranof, Chichagof, and adjacent islands.

BACKGROUND

Mountain goat populations were established on Baranof Island in 1923 when 18 animals were transplanted from Tracy Arm in Game Management Unit 1 (Burris and McKnight 1973). Goats were not believed to have been indigenous to the island, although early written Russian history is confusing with references to "white deer." Hunting was initiated in 1949 on descendants of the 1923 introduction, and seasons have continued to this time. In 1976 a registration permit system was initiated. Since that time the harvest has ranged from 28 to 75 goats per year.

In the mid-1950s goats were transplanted to Chichagof Island (Burris and McKnight 1973), but populations did not become established. The last report of a goat on Chichagof was in 1978 (Johnson 1981). Mountain goat populations do not exist on Admiralty or any other island in the unit. Baranof Island goats appear to be increasing and dispersing, with recent expansions of animals to the southern part of the island.

The effects of severe winters on goat populations are poorly understood. Consistent goat surveys are needed to better understand the effects of varying snow accumulations. Throughout most goat habitat on Baranof Island, hunter access is difficult. Weather patterns during open goat seasons play an important role in regulating the harvest.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Manage Baranof Island goat populations to provide for maximum sustained annual use by hunters and wildlife viewers. Maintain an island-wide population in excess of 1000 goats.

MANAGEMENT OBJECTIVES

1. Maintain a population sufficient to provide an annual harvest of at least 35 goats;
2. Maintain $\geq 50\%$ males in the harvest of goats 1–6 years of age; and
3. Maintain a mountain goat population sufficient to provide an annual hunter success rate of at least 15%.

METHODS

Unit 4 goat hunting is administered through a registration permit system (Hunt RG150). Hunters obtain permits without charge, but successful hunters are required to report within 10 days of taking a goat. All other permittees are required to report by mid-January. Information from the reports includes area hunted, number of days hunted, kill date, sex of goat harvested, transportation used, and any use of commercial services. Successful hunters are also encouraged to bring in the horns from their goat for age determination.

Late summer aerial surveys are conducted periodically in selected areas. During September 1998 an extensive survey designed to determine goat distribution was conducted island-wide.

A total of 135 goat horns voluntarily submitted by successful hunters were examined during 1998–2001. Incremental growth measurements, age, and width between horn bases were recorded on standardized forms (Appendix A), in an attempt to determine growth rates and characteristics of Baranof Island goats as they relate to varying winter severity.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

During September 1998 an extensive aerial survey of goat habitat on Baranof Island was conducted, resulting in a tally of 1013 goats. This number should be viewed as a minimum number of goats inhabiting the island, as sightability data have not been established. I suspect that conditions were near optimal, resulting in at least 65% of all goats being seen. Under this assumption the goat population on the island may exceed 1350 animals. Since that time, only select portions of Baranof Island have been surveyed. Additional survey effort should be expended in future years to determine sightability, leading to more precise population estimates.

Currently it appears that goat populations continue to expand both spatially and numerically on Baranof Island. However, because of differences in observers, pilots, area surveyed, and type of aircraft used, it is impossible to infer goat abundance from the number of goats observed per hour of survey time.

Summer alpine range is not currently threatened by destructive resource extraction activities (logging and mining with accompanying roads), and winter range appears to be secure for the immediate future. The only recent population estimate for Baranof Island was made in 1991 by E. L. Young, who estimated 1000 goats (cited by Faro 1994), and the population has undoubtedly increased since that time.

Population Composition

Kid percentages in the observed segment of the goat population have varied widely, from a low of 10 to a high of 41%. These data should be viewed cautiously because of differences in observers, pilots, type of aircraft used, and timing of surveys. Hunters generally select males, so harvest sex ratios do not reflect population-wide sex ratios.

From 1976 to present, 826 harvested goats have been aged based on discreet annuli in horns (Brandborg 1955). With the exception of kids and yearlings, I suspect that hunters are not selecting against any age class of goat. It is clear that billies are selected over nannies. With this in mind, I assume that within a particular sex, hunter harvest generally gives some indication of the proportion of goats in the population. The long-term median age of billies taken by hunters from Unit 4 is 2 years old, while median age of nannies is 3 years (Figure 1). Mean ages of harvested billies and nannies are 3.83 years and 4.88 years, respectively.

Nannies probably live longer than billies. Eight percent of harvested nannies were ≥ 10 years of age, whereas less than 2% of billies were ≥ 10 years. The oldest nanny killed was 17 years and the oldest billy was 13 years.

Distribution and Movements

Mountain goats inhabit all available summer range on Baranof Island north of Gut and Whale bays. Goat densities in the various alpine areas are unknown, but I suspect that at least some goat habitats are saturated. There are occasional goat observations south of Whale and Gut bays reported by the public, and I suspect that as populations increase those areas will support additional goats. Winter habitat is more difficult to define, but south-facing cliffs are apparently preferred.

Horn Growth Rates

In an effort to better understand growth characteristics of Unit 4 goats, hunters were asked to voluntarily submit horns for aging and measuring. A total of 135 goats from the 1998–2001 seasons yielded data on horn growth.

I suspect that horn growth reflects body growth patterns. Because no annuli are discernable until a goat reaches 1.5 years of age, and this “annulus” encompasses 2 growth years (0–0.5 and 0.5–1.5), the data cannot be used for analyses of single-year growth. Likewise, growth from the year of death cannot be reliably used, as growth may not be completed during that particular year. Additionally, after 6 years of age, growth annuli are so small that accurate measurements are impossible. The 1998–2001 horn measurements yielded 270 usable annuli that could be assigned to any particular year.

Despite earlier indications that incremental horn growth may reflect winter severity (Whitman 2000), addition of horn growth data from the 1999–2001 seasons has led to the conclusion that there is no correlation between horn growth and winter severity (Figure 2).

MORTALITY

Harvest

Season and bag limit

1 goat by registration permit only

Resident and nonresident hunters

Aug. 1–Dec. 31

(General hunt only)

Regulations adopted by the Federal Subsistence Board are identical to state regulations.

Board of Game Actions and Emergency Orders. Although Board of Game action was not required, prior to the fall 2000 hunting season we shortened the reporting period for successful goat hunters to 5 days region wide, under discretionary permit hunt requirements. No Board actions were taken and no emergency orders were issued during the period.

Hunter Harvest. During 1999 and 2000, 300 and 312 registration permits were issued, respectively (Table 1). This resulted in 36 (1999) and 60 (2000) goats being legally harvested. The percent of permittees who actually hunted was 40% and 49%, respectively, during the 2 years. For those hunters going afield, the success rate was 30% in 1999 and 39% in 2000. Five-year averages for the period 1996–2000 were: permits issued, 307; hunters afield, 138; and reported goat harvest, 51. Hunters reported sex of goats in the harvest as 61% males in 1999 and 52% in 2000 (Table 1). With the current population estimate for goats in Unit 4 at 1367 animals, documented harvest accounts for a mortality less than 4% annually.

Permit Hunts. All goat hunting in Unit 4 is conducted under a registration permit system.

Hunter Residency and Success. Baranof Island residents continue to be the primary users of Unit 4 goats (80% of hunters were local residents during 1999 and 2000, Table 2). The proportion of nonresident, guided hunters appears to be increasing (12% in both years), although numbers are still low.

Harvest Chronology. Weather appears to be the primary factor controlling hunter effort and chronology of the goat harvest in Unit 4. Typically, few goats are harvested during November and December when consecutive low-pressure systems bombard Southeast Alaska with rain and/or snow. However, this trend appears to be changing, with more hunters electing to hunt after early-season snows drive goats to lower elevations. During 2000, 19 goats (32%) were harvested during December, with lesser numbers in all other months (Table 3). During 1999, hunters took the largest monthly total during November, when 11 goats (31%) were reported harvested.

Transport Methods. Boats continue to provide the majority of transportation for Unit 4 goat hunters. During 1999 and 2000, successful hunters used boats for primary access 78% and 77%, respectively (Table 4).

Other Mortality. No estimates of extent or causes of other goat mortality have been made. I suspect that bear-caused mortality occurs, but its significance is unknown. Winter starvation and accidental deaths due to falls, rockslides, and avalanches undoubtedly take some toll on the population.

HABITAT

Assessment

No data are available regarding habitat quality. Relatively high numbers of kids observed during late summer composition surveys and good body condition of harvested goats suggests that habitat is in relatively good shape.

Enhancement

No habitat enhancement activities were conducted on goat range during this report period; there are no plans for future assessment or enhancement of goat habitat.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Efforts should continue to monitor timber extraction activities and additional road building associated with logging. On Baranof Island, habitat degradation activities appear to be minor.

CONCLUSIONS AND RECOMMENDATIONS

Unit 4 mountain goat populations appear to be secure at this time. I recommend that current state regulations remain in effect concerning season dates and bag limits. The current system of registration permit hunting appears to be working well and causes little additional effort on the part of hunters. I commend hunters for their willingness to voluntarily submit horn sets for evaluation. Future assessment work should be explored in an effort to determine goat sightability during aerial survey efforts. These data will allow a better estimation of goat population size on the island.

In February 2002, Region I Division of Wildlife Conservation wildlife managers met in Ketchikan to review existing goat management objectives. As a result of that meeting, revised objectives will be put in place for the region.

LITERATURE CITED

- BRANDBORG, S. M. 1955. Life history and management of the mountain goat in Idaho. Idaho Department of Fish and Game, Wildlife Bulletin No. 2. Boise.
- BURRIS, O. E. AND D. E. MCKNIGHT. 1973. Game transplants in Alaska. Alaska Department Fish and Game. Technical Bulletin No. 4. Juneau. 57pp.
- FARO, J. B. 1994. Mountain goat survey-inventory management report. Pages 33–38 *in* M.V. Hicks, editor. Annual report of survey-inventory activities. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Project Report. Project W-24-1 and W-24-2. Job 12. Juneau. 144pp.
- JOHNSON, L. J. 1981. Mountain goat survey-inventory progress report. Pages 59–62 *in* R.A. Hinman, ed. Annual report of survey-inventory activities. Part III. Bison, caribou, mountain goat, muskoxen, and sheep. Volume XI. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Project Report. Project W-17-12. Job 12. Juneau. 116pp.
- WHITMAN, J. S. 2000. Mountain goat survey-inventory management report. Pages xx–xx *in* M.V. Hicks, editor. Annual report of survey-inventory activities. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Project Report. Project W-24-1 and W-24-2. Job 12. Juneau. xxxpp.

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Table 1 Unit 4 mountain goat harvest data for registration permit hunt RG150, regulatory years 1996–2000

Year	Permits issued	Did not report	Did not hunt	Unsuccessful hunters	Successful hunters	Males	Females	Sex unk.	Illegal	Total Harvest
1996	272	0	152	78	42	26	15	1	0	42
1997	326	0	188	83	55	36	18	1	0	55
1998	326	1	167	95	63	36	27	0	0	63
1999	300	0	181	83	36	22	14	0	0	36
2000	312	2	160	90	60	31	29	0	0	60

Table 2 Unit 4 mountain goat hunter residency and success for registration permit hunt RG150, regulatory years 1996–2000

Year	Successful				Unsuccessful				Total hunters
	Local ^a resident	Nonlocal resident	Nonres	Total	Local ^a resident	Nonlocal resident	Nonres	Total	
1996	41	1	0	42	66	11	1	78	120
1997	45	5	5	55	69	11	3	83	138
1998	48	8	7	63	77	16	2	95	158
1999	22	5	9	36	70	8	5	83	119
2000	47	1	12	60	76	8	6	90	150

^aResidents of Baranof Island.

Table 3 Unit 4 mountain goat harvest chronology by month for registration permit hunt RG150, regulatory years 1996–2000

Year	Month					Total
	August	September	October	November	December	
1996	4	13	3	9	13	42
1997	24	9	6	9	7	55
1998	11	12	18	13	9	63
1999	8	8	4	11	5	36
2000	9	10	12	10	19	60

Table 4 Unit 4 mountain goat harvest by transport method used by successful hunters for registration permit hunt RG150, regulatory years 1996–2000

Year	Airplane	Boat	Snow machine	Offroad vehicle	Vehicle	Walked	Total
1996	12	25	1	0	3	1	42
1997	18	30	0	0	4	3	55
1998	8	50	0	1	3	1	63
1999	4	28	0	0	3	1	36
2000	9	46	0	0	1	4	60

Appendix A

MOUNTAIN GOAT HORN STUDY

NAME _____

DATE OF KILL _____

LOCATION OF HARVEST _____

AGE OF GOAT _____ CERTAINTY? A B C

SEX OF GOAT _____

(all measurements to nearest 1/16 inch)

LENGTH OF LEFT HORN _____ BROOMED? Y N

BASAL CIRCUMFERENCE OF LEFT HORN _____

LENGTH OF RIGHT HORN _____ BROOMED? Y N

BASAL CIRCUMFERENCE OF RIGHT HORN _____

ANNULUS LENGTHS (Use longer horn)

0-1.5 years _____

1.5-2.5 years _____

2.5-3.5 years _____

3.5-4.5 years _____

4.5-5.5 years _____

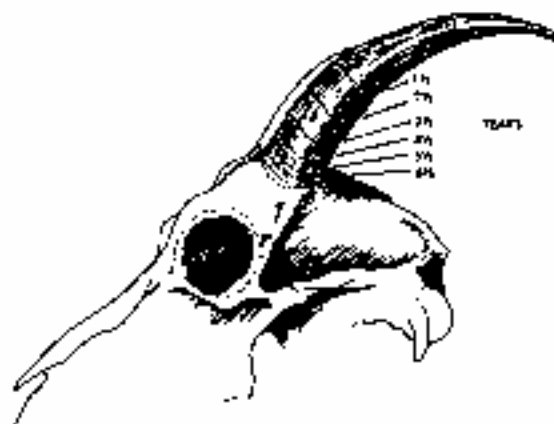
5.5-6.5 years _____

6.5-7.5 years _____

7.5-8.5 years _____

8.5-9.5 years _____

9.5-10.5 years _____



Annual rings on the horn of the mountain goat (after Brandborg 1955)

WIDTH BETWEEN HORN AND BASES _____

MEASUREMENTS RECORDED BY _____ DATE _____

Figure 1. Age at death of 826 mountain goats (*Oreamnos americanus*) harvested from 1976–2000 in Game Management Unit 4, Southeast Alaska.

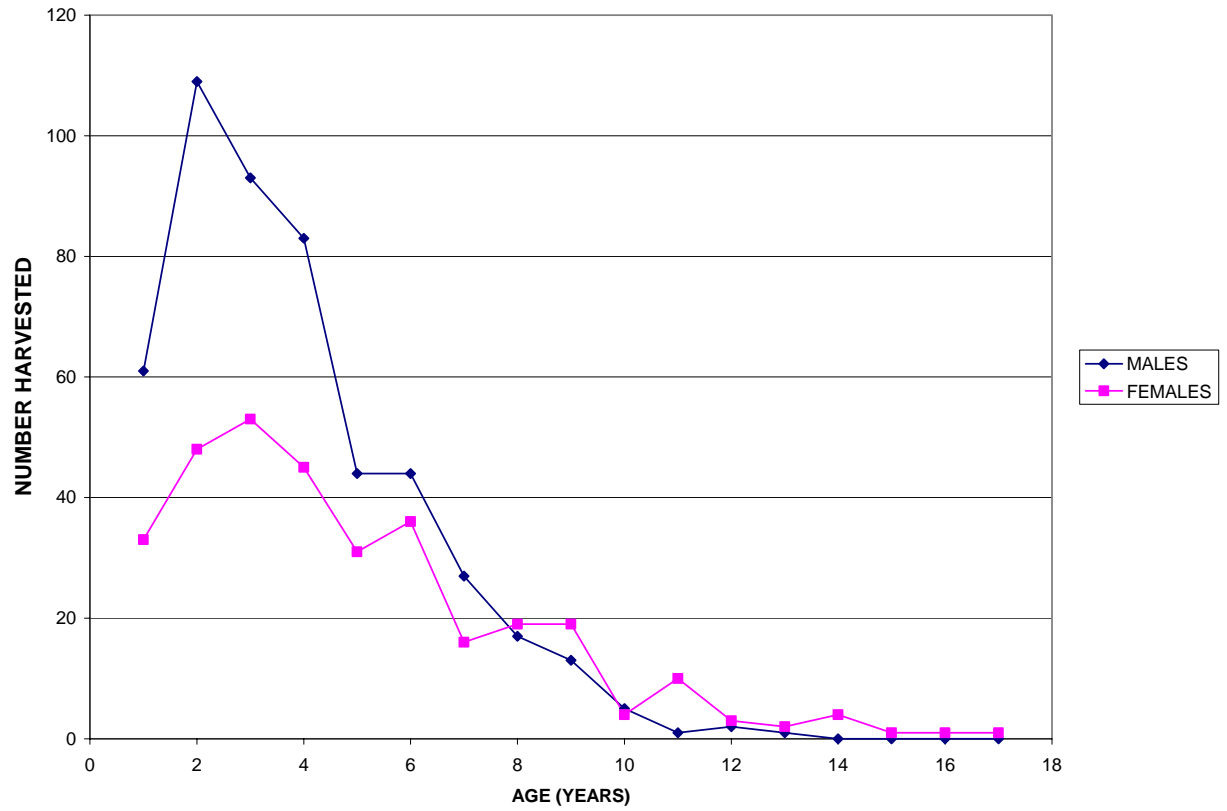
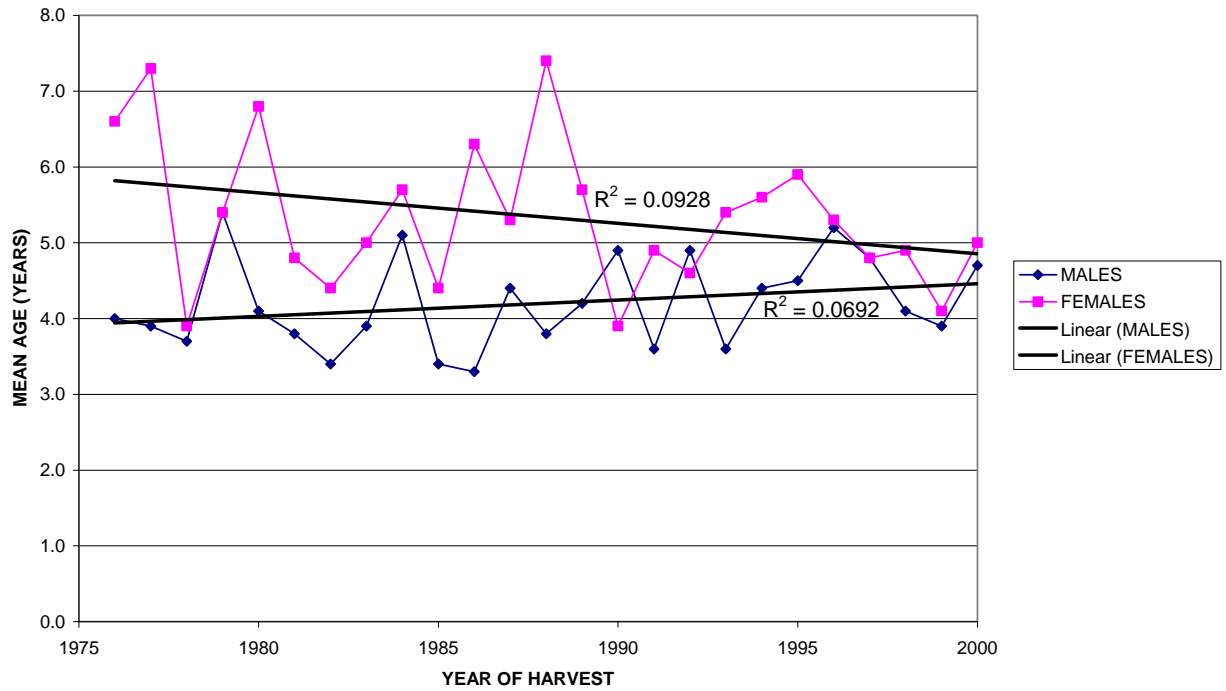


Figure 2. Mean age of harvested mountain goats (*Oreamnos americanus*) from 1976–2000 in Game Management Unit 4, Southeast Alaska.



SPECIES MANAGEMENT REPORT

Alaska Department of Fish and Game
DIVISION OF WILDLIFE CONSERVATION
PO BOX 25526
JUNEAU, AK 99802-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999

To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 5 (5800 mi²)

GEOGRAPHIC DESCRIPTION: Cape Fairweather to Icy Bay, eastern Gulf of Alaska coast.

BACKGROUND

Mountain goats have been present in the eastern Gulf Coast region since recorded history began. Klein (1965) surmised that goats extended north and west from a southern refugium and that the present northern and western limits of distribution may be the result of a relatively recent arrival in the area. Unlike other large mammals in the Yakutat Forelands area (*i.e.*, moose and bear), mountain goats may have traveled up the coast rather than down the Tatshenshini/Alsek River corridor.

Alaska Natives used mountain goat hides for clothing and other domestic purposes. Recreational hunting was occurring by the early 1970s, and probably earlier because Yakutat was the site of a large military base during World War II.

The Alaska Department of Fish and Game first conducted aerial goat surveys in this Unit in 1971. In that year, 283 goats (33 kids:100 adults) were enumerated between Gateway Knob and Harlequin Lake in the Brabazon Mountains. By 1973 Game Division biologists had documented a significant decline in goat numbers in the area, attributed primarily to severe winter weather. Unit 5A surveys and anecdotal accounts from guides, pilots, and hunters during the 1980s indicated that goat numbers were higher than recorded in the early 1970s. In the 1990s no aerial surveys were conducted, but anecdotal information from hunters and guides suggests that goats were relatively abundant throughout the area.

Nearly all Unit 5 hunting effort is concentrated in Unit 5A for several reasons. First, much of Unit 5B is in Wrangell St. Elias National Park and closed to hunting for mountain goats (the national preserve remains open to hunting), and secondly, the primary goat habitat open to hunting is at Icy Bay and is difficult to access. Private property there belongs to a Native corporation and is not open for hunting to the general public.

There is a state registration permit hunt and a federal hunt for goats in this unit. Season dates for the federal hunt extend to the end of January, whereas the state hunt ends at the end of December. ADF&G receives information from all successful hunters, but information from

unsuccessful federal permittees is often difficult to attain, as the US Fish and Wildlife Service, the data manager, is not adamant about reporting requirements.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Unit 5 mountain goat management objectives identified by staff are as follows:

1. Increase the estimated population from 850 to 1250 goats;
2. Maintain a hunter success rate of 25%; and
3. Conduct aerial surveys in areas of concentrated harvest at least every 3 years.

METHODS

Several aerial surveys were conducted within the unit for the first time since 1989. Lack of survey effort during the 1990's was the result of a combination of factors including weather, staffing changes, and loss of the assistant area biologist position for northern Southeast Alaska. Yakutat's distance from the Douglas Area Office makes it difficult to plan for and conduct aerial surveys there. Because of a higher than usual harvest of goats in Nunatak Fiord during the report period, we made it a priority to begin collecting goat population information in this unit. Hunters were required to obtain registration permits from ADF&G offices, which helped in-season monitoring of hunter effort and success. Information collected from registration reports included the number of days hunted, method of transportation used, hunt dates, commercial services used, and sex and date of kill. Anecdotal information was gathered from hunters, ADF&G field personnel, and USFS personnel stationed in Yakutat.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Aerial surveys were conducted throughout much of Unit 5A during this report period (Table 1). Since there is not an optimal survey aircraft stationed in Yakutat, these surveys were flown opportunistically when the USFS had a helicopter available. The area from Alsek Lake to Tanis Lake was surveyed under very warm mid-day conditions, resulting in few goats being seen despite the presence of numerous tracks on snowfields. Information from this survey is only marginally useful. The area between Harlequin and Tanis lakes and the north side of Nunatak Fiord were both surveyed under cool and overcast conditions, conducive to good survey results. The number of goats per hour and the percent kids observed in the area east of Harlequin Lake were indicative of healthy goat populations. On the north side of Nunatak Fiord, goat numbers were lower than expected, but further survey efforts should give us a better indication of the population status.

Overall, aerial surveys indicated that Unit 5 goat populations were healthy based on the number of goats seen per hour and the number of kids in the population. In the past we estimated about 1000 goats in Unit 5. Although we did not conduct unitwide aerial surveys during the report period, we did survey approximately 50% of Unit 5A (or 25% of Unit 5) and counted 150 goats under poor conditions. We estimate that sightability was about 50%, thus actual goat numbers

would be about 300 in the area surveyed, and translates to a unit wide population estimate of about 1,000 goats.

MORTALITY

Harvest

Season and bag limits

1 goat by registration
permit only

Resident and nonresident hunters

Aug. 1–Dec. 31
(General hunt only)

Hunter Harvest. Twenty-nine goats were harvested during the report period, 19 in 1999 and 10 in 2000, all taken under state registration permits. The sharp increase in harvest during 1998 and 1999 can be attributed to an increase in non-local resident and nonresident hunters (Table 3). Two local residents were guiding illegally and were charged and convicted during the fall of 1999. In addition to these two illegal operations, there was also a Yakutat resident who was transporting non-local goat hunters to the field. Largely because of these factors the goat harvest increased to the point where we were forced to close part of Unit 5A by emergency order in 2000. The percentage of males harvested was 53% in 1999, 70% in 2000, and 59% overall. The 2-year average is slightly lower than the 63% male harvest over the previous 9 years (Table 2). There were 4 goats of unknown sex killed, and for conservative management purposes we counted these as female goats. Three of the goats harvested during the report period were taken in Unit 5B.

The harvest of 19 goats in 1999 was the highest since 1983 when 23 goats were killed. Goat hunting has never attracted a lot of attention in Yakutat, probably due to the cost and logistical difficulty of hunting goats there. During 1990–97 the average harvest of goats in Unit 5 was only 8. The reduction in kill from the early 1980s appeared to be related more to decreased effort rather than reduced success rate or a decline in goat numbers (Table 3). During 1999–2000, the number of hunters decreased by 3 from the previous report period (Table 4), while the number of goats harvested increased from 21 to 29 animals (Table 2). Most of the harvest occurred in 1999 when the illegal guiding activity was taking place, and nearly all of the harvest came from Nunatak Fiord. Anecdotal information from some Yakutat residents suggests that there may have been additional illegal harvest during the report period, but it is impossible to quantify.

Permit Hunts. A total of 44 and 45 registration permits were issued during 1999 and 2000, respectively, 20 fewer than the previous report period (Table 4). Hunting effort differed slightly between 1999 and 2000 with 26 and 21 people hunting, respectively. The mean of 24 hunters per year during the report period is similar to the 1997–98 mean of 25, but noticeably higher than 1990–1996 when an average of 18 people hunted each year. The registration permit strategy remains a viable method for effectively managing goat hunting in this unit.

No information on federal goat permits was obtained from the USFS during this report period.

Hunter Residency and Success. Goat hunter success averaged 62%, substantially higher than the previous 2-year mean of 42% (Table 3). Eight of 19 successful hunters in 1999 were Yakutat residents; in 2000 Yakutat residents did not harvest any goats. During this same period, harvest by other Alaska residents went from 3 in 1999 to 6 in 2000. Nonresidents accounted for 5 goats

in 1999 and 4 in 2000. There were also 3 goats harvested in 1999 that were taken illegally, but there is confusion as to who took them. Alaska State Fish and Wildlife Protection Troopers provided us information associated with this investigation, but we have not ascertained a clear picture of these events. The number of Yakutat residents hunting during the 1999–2000 period was 13, nonlocal Alaska residents 15, and nonresidents 16. Several events in Unit 5 will result in a change in hunting effort that favors local residents. First, the USFS is considering a decrease in the number of allowed commercial goat hunts which will lower the nonresident effort, and local sentiment against non-local hunters in Yakutat may result in a reduction in transporter efforts.

Harvest Chronology. The Unit 5 goat harvest is usually spread throughout the season, with the greatest number of goats typically taken during September and October. The 1999 harvest was concentrated in November when all but 2 of the 19 goats were taken. This was due to an increase in late season hunting pressure, when goats were forced to lower elevations by snow and were accessible on cliffs in Russell Fiord. In 2000, the harvest was divided more evenly throughout the fall with 2 being taken in September, and 3 each in October and November.

Transport Methods. Eighty-four and seventy percent of successful hunters used boats during 1999 and 2000, respectively. In most cases goats are hunted from saltwater, and landing an aircraft in these areas is hazardous. Also, hunting from a boat allows hunters the latitude of covering large areas of goat habitat with little effort, whereas a hunter dropped off by airplane is limited to a much smaller area.

Other Mortality

Some anecdotal reports were received from guides and hunters regarding wolf predation on goats, but there is no evidence that it has a major effect on the population. Winter weather probably plays more of a factor in goat mortality, as Yakutat often gets deep, persistent snowfall.

CONCLUSIONS AND RECOMMENDATIONS

Efforts to obtain mountain goat population information through aerial sex and age composition counts were a priority during the last year of this report period. Additional effort should be made over the next several years to gather population information, especially in the Nunatak Fiord area. Hunting pressure is increasing, and better population information, especially in areas of concentrated harvest, is essential. Our hunt records indicate that hunting effort has been low in most areas in Unit 5, and based on aerial surveys we believe that goat populations could support additional harvest in all but the most popular hunt areas.

In February 2002, Region I Division of Wildlife Conservation wildlife managers met in Ketchikan to review existing goat management objectives. As a result of that meeting, revised objectives will be put in place for the region.

LITERATURE CITED

KLEIN, D. R. 1965. Postglacial Distribution Patterns of Mammals in the Southern Coastal Regions of Alaska. Arctic, Vol. 18, No. 1.

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Table 1 Unit 5 mountain goat composition counts, regulatory years 1986 through 2000

Year	Number adults	Number kids	Total goats	Kids:100 adults	Percent kids	Goats/ hour
1986	36	11	47	31	23	40
1987	196	53	249	27	21	60
1988	140	53	193	38	27	56
1989	64	29	93	45	31	47
1990–1999	NO SURVEYS					
2000	NUNATAK BENCH					
	69	13	82	19	16	91
	40	6	46	15	13	52
	EAST HARLEQUIN LAKE					
	55	16	71	29	23	70
	GATEWAY KNOB¹					
	48	4	52	8	8	25

¹ Survey flown under warm and sunny conditions.

Table 2 Unit 5 annual goat harvest, regulatory years 1990 through 2000

Year	Males	Females	Unknown	Total
1990	11	2	0	13
1991	4	4	0	8
1992	2	2	0	4
1993	4	2	0	6
1994	6	6	0	12
1995	4	2	0	6
1996	5	2	0	7
1997	3	2	0	5
1998	9	6	1	16
1999	10	6	3	19
2000	7	2	1	10

Table 3 Unit 5 goat hunter success by community of residence, regulatory years 1990 through 2000

Year	Percent success	<u>Successful hunters</u>			<u>Unsuccessful hunters</u>		
		Unit resident	Other AK	Non-resident	Unit resident	Other AK	Non-resident
1990	43	3	4	6	3	11	3
1991	47	2	5	1	1	2	6
1992	31	2	2	0	1	2	6
1993	50	0	0	6	3	0	3
1994	71	8	3	1	2	1	2
1995	29	2	0	4	10	2	3
1996	39	3	1	3	4	4	3
1997	29	4	1	0	6	4	2
1998	48	5	4	7	8	4	5
1999 ¹	73	8	3	5	2	3	2
2000	48	0	6	4	3	3	5

¹ Three goats were taken illegally by hunters of unknown residency.

Table 4 Unit 5 goat hunter effort and success, regulatory years 1990 through 2000

Year	<u>Successful hunters</u>				<u>Unsuccessful hunters</u>			<u>Total hunters</u>		
	Permits issued	Nr hunters	Total days	Avg nr days	Nr hunters	Total days	Avg nr days	Nr. hunters	Total days	Avg nr days
1990	46	13	42	3.2	17	80	4.7	30	122	4.1
1991	42	8	22	2.8	9	16	2.7	17	38	2.7
1992	35	4	8	2.0	9	29	3.2	13	37	2.8
1993	39	6	12	2.0	6	25	4.2	12	37	3.1
1994	41	12	28	2.3	5	12	2.4	17	40	2.4
1995	57	6	19	3.2	14	47	3.4	20	66	3.3
1996	51	7	17	2.4	11	48	4.4	18	65	3.6
1997	53	5	8	1.6	12	26	2.6	17	34	2.3
1998	56	16	55	3.4	17	59	3.5	33	114	3.5
1999	44	19	31	1.6	7 ¹	15	3.0	26	46	1.9
2000	45	10	31	3.1	11	16	1.5	21	47	2.2

¹ Days per hunt data only available for 5 of these hunters.

Table 5 Unit 5 transport methods used by successful goat hunters, regulatory years 1990 through 2000

Year	<u>Airplane</u>		<u>Boat</u>		<u>Snowmachine</u>		<u>Highway vehicle</u>		<u>Foot</u>	
	Total	%	Total	%	Total	%	Total	%	Total	%
1990	11	85	0	0	2	15	0	0	0	0
1991	4	50	4	50	0	0	0	0	0	0
1992	2	50	2	50	0	0	0	0	0	0
1993	4	66	1	17	0	0	0	0	1	17
1994	0	0	9	75	3	25	0	0	0	0
1995	6	100	0	0	0	0	0	0	0	0
1996	3	43	4	57	0	0	0	0	0	0
1997	0	0	5	100	0	0	0	0	0	0
1998	6	40	9	60	0	0	0	0	0	0
1999	3	16	16	84	0	0	0	0	0	0
2000	3	30	7	70	0	0	0	0	0	0

Table 6 Unit 5 commercial services used by goat hunters, regulatory years 1990 through 2000

Year	<u>Unit residents</u>		<u>Other AK residents</u>		<u>Nonresidents</u>		<u>Total use</u>		Registered guide
	No	Yes	No	Yes	No	Yes	No	Yes	
1990	0	0	0	0	0	6	0	6	6
1991	2	1	2	4	0	6	4	11	6
1992	3	0	1	1	1	7	5	8	6
1993	0	0	0	0	0	6	0	6	6
1994	8	0	0	1	0	3	8	4	4
1995	11	1	2	0	0	7	13	8	7
1996	4	0	1	3	0	5	5	8	6
1997	7	2	4	1	0	2	11	5	2
1998	12	0	4	3	0	12	16	15	2
1999	11	0	5	0	0	7	16	7	7
2000	3	0	3	6	0	8	6	14	8